# A cross-country repository of details on the innovation and science policy instruments available to firms in eight countries (2007–2020): The devil is in the detail

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# Contents



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## Executive Summary

The information contained in this report was gathered and analysed as part of an exhaustive search of innovation and science policy instruments in eight countries. Extensive detail on each policy instrument is offered in order to facilitate cross-country comparisons focusing on the period 2007 to 2020. Innovation and science policy instruments in Ireland, Germany, the United Kingdom, Belgium, Denmark, Israel, Singapore, and Norway are examined. All of the selected countries are highly active in providing different forms of public support for firm-level innovation and science activities. Therefore, understanding the cross-country similarities and differences in the policy instruments offered among this group of countries can offer insights on policy design, implementation, and impact.

The analysis of innovation and science policy instruments is split across two sections for each respective country. The first section offers an 'at a glance' perspective of the instruments. This includes the eligibility requirements and other such information that funding agencies readily provide to the public. Building on the information provided in the first section, the second section provides a greater level of detail and nuance than is available in most publicly available country-level repositories of information on innovation and science policy instruments. This level of detail is important when comparing nominally similar policy instruments across countries. It enables the reader to gain a better understanding of the mechanisms through which innovation and science policy instruments impact firms and produce different firm-level innovation and science outcomes.

This report finds that each country offers a unique policy mix with regard to the innovation and science policy instruments available to firms. While there are some policy instruments available across countries (seemingly similar on the surface), there can be subtle, but important differences that alter the manner in which firms engage with the instruments. Additionally, funding agencies have made changes to the instruments they offer, or moreover, how the instruments are offered to firms over the period 2007–2020. This demonstrates the dynamic nature of innovation and science policy instruments at the firm level, and the importance of examining the characteristics of these instruments in the level of detail undertaken in the current report.

## Section 1. Introduction

This report provides a detailed examination of the innovation and science policy instruments available to firms in eight countries covering the period 2007-2020. Specifically, Ireland, Germany, the United Kingdom (UK), Belgium, Denmark, Israel, Singapore, and Norway are the focus of examination. The key similarities and differences in the way that innovation and science policy is operationalised through the use of policy instruments is examined. The report clearly highlights that nominally similar innovation and science policy instruments can differ significantly in terms of their country-specific design features. These country-specific differences in policy instrument design can, in turn, lead to different impacts on firm-level Research and Development (R&D), innovation and performance outcomes. It is particularly important to understand the differences between nominally similar policy instruments when carrying out a cross-country comparison.

The allocation of scarce public funding to support the R&D and innovation performance of private firms is of much interest to both policymakers and academics alike (Fudickar and Hottenrott, 2019; Lenihan and Mulligan, 2018; Haapanen et al., 2014). The economic return on these public investments is similarly important, because public spending in growth-enhancing activities such as R&D and innovation is crucial for national competitiveness and economic growth (Petrin, 2018; Lenihan et al. 2018; Szarowská, 2017; Akcali and Sismanoglu, 2015).

In the Lisbon (2000) and Barcelona (2000) strategies, the European Union (EU) targeted an investment level of three percent of Gross Domestic Product (GDP) for R&D (European Commission, 2003), with two thirds intended to be undertaken by the private sector. Very few countries have achieved this benchmark, and of those that have, it has been difficult to maintain (European Commission, 2011). Within the European Union, the European Agenda for Research and Innovation states that "innovation must be a central driver for EU policies and programmes for 2021-2027" (European Commission 2018, p. 6). While business expenditure on R&D (BERD) is crucial, the precise policy instruments necessary to support BERD remain elusive (Becker, 2015; Dimos and Pugh, 2016; Mulligan et al., 2019).

Private firms play an important role regarding the discovery and diffusion of new knowledge and technologies (Schuelke-Leech, 2018). For firms, R&D and innovation create a competitive advantage (Anning-Dorson, 2018). However, due to the risky and uncertain nature of R&D projects, as well as the public good characteristics of knowledge, firms tend to under-invest in R&D activities, as seen from a societal perspective (Bloom and Williams, 2019; Inglesi-Lotz, 2017; Cowling, 2016). Given this classic public good problem, R&D and innovation are subject to market failure (Choi and Lee, 2017), which means that the investments in R&D activities from the private sector tend to fall below the socially optimum level (Czarnitzki and Hussinger, 2018). Governments thus seek to equate the public and private returns to R&D by subsidising and supporting private firms' investment (Kleer, 2010). Policymakers deploy a range of different policy instruments to this effect, such as R&D grants and R&D tax credits (Borras and Edquist, 2013).

Of the countries selected for inclusion in the current report, Ireland, Denmark, Israel, and Singapore are all members of the Small Advanced Economies Initiative (SAEI). The SAEI was formed to facilitate the sharing of policy lessons among a defined group of countries with similar economic characteristics (DBEI, 2018). SAEI countries have similar populations,

advanced industrial bases, and levels of public investment in innovation and science. As such, the SAEI countries represent a natural group for cross-country comparison (DBEI, 2019). It is also important to include larger, innovation-leader economies such as the UK and Germany (European Commission, 2019a), as they provide a crucial reference point at a larger scale than the SAEI countries. The inclusion of the innovation leader countries provides key insights regarding the differences in approach between leaders and non-leaders. This can shed some light on the following question: What makes *these* countries innovation leaders compared to the *other* countries? The comparison between countries may help to reveal this. Similarly, Belgium and Norway are not large, innovation leader countries, nor SAEI members. However, both countries are highly active in terms of providing public financial support for firm-level R&D and innovation (Dumont, 2017; Nilsen et al., 2020). As such, Belgium and Norway provide an interesting 'middle ground' between the SAEI countries and the large innovation leader countries, which is useful for comparison.

The key focus of this study is Ireland, and how other countries compare relative to the Irish context. As Skilling and O'Sullivan (2019) outline, there are many similarities across the SAEI countries that make them an interesting comparison with Ireland. There is consistent variation between the competitiveness pillars across the small, advanced economies. Many SAEI countries have significantly higher export shares than larger advanced economies. Most of these countries invest above two percent of GDP on R&D activities. With so many similarities between the SAEI countries, such countries offer themselves as natural comparisons with each other, and an interesting counter point to the other non-SAEI countries included in this report.

This report examines the diverse mix of innovation and science policy instruments available to firms across these eight countries, in an effort to provide a useful cross-country comparison. A *policy instrument* is defined here as the mechanism by which policymakers and funding agencies allocate funding to private firms to achieve policy objectives. This is in line with definitions employed in existing literature on the topic (Guy et al., 2009; Dumont, 2017). In addition, the policy instruments considered here all fall on a spectrum in terms of their focus on knowledge creation (Nonaka, 1994) and knowledge transformation (Pavitt, 2006). For the purposes of this report, supports that focus more on knowledge creation are considered *science policy instruments* (British Science Council, 2014), while supports which focus on knowledge transformation are considered *innovation policy instruments* (Roper et al., 2008; Roper and Avartis, 2012).

In this report, the innovation and science policy instruments available to firms in each country are compiled into a taxonomy, providing details on their goals, mode of implementation, and characteristics. Using this taxonomy, the manner in which each instrument interacts with firms can be examined, as well as the possible impacts the instruments may have. Each country's taxonomy is compiled following an exhaustive search of policy documents, academic literature, funding agencies websites (containing information on innovation and science policy instruments), as well as direct communication with funding agencies and government bodies in each country. This provides a thorough analysis of the available information. Between 2007 and 2020, countries have experienced different macroeconomic environments, including periods of recession, recovery, and growth. As such, there have been periods where countries may not have been as able to allocate scarce resources towards R&D and innovation. By examining a longer time period as undertaken in this report, a more accurate representation of each country's support for BERD can be observed. The period 2007-2020 provides a sufficient

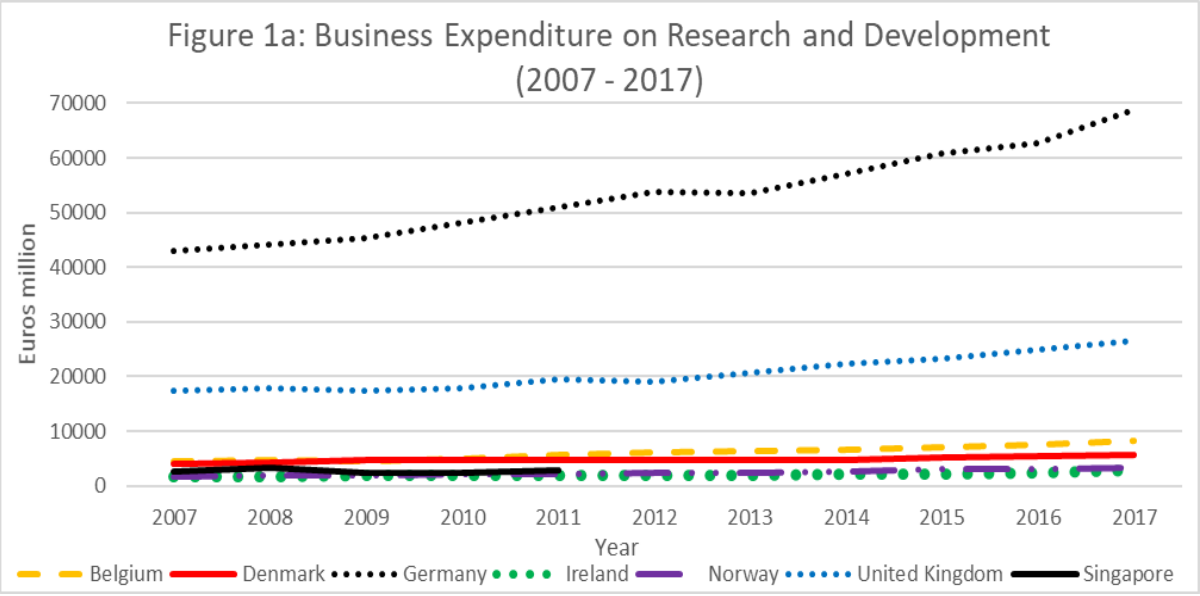
time span to examine what instruments have consistently been available to firms, and moreover, what changes have been made to the policy instrument mix over time.

The remainder of the report is structured as follows. Section 1.1 provides an overview of the eight countries that are examined. This provides context for the discussion which follows. Section 2 details the methodological approach adopted in compiling the report. Section 3 outlines the key funding agencies that exist in each country, before examining the policy instruments/interventions in detail. Section 4 offers the key conclusions and observations from the cross-country comparison.

## Section 1.1 Overview: An 'at a glance' country perspective

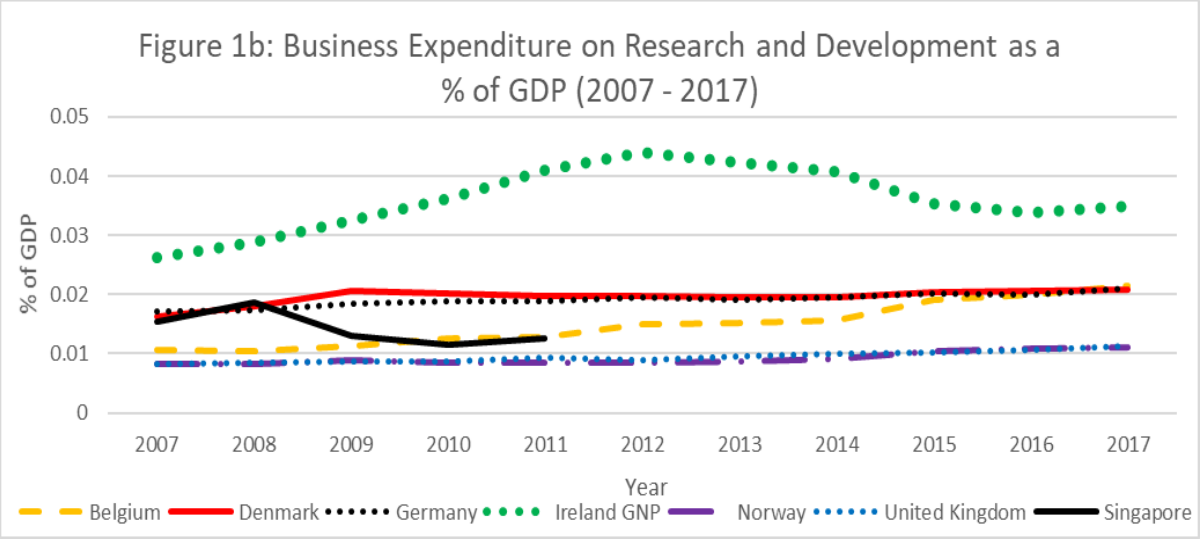
Prior to examining the innovation and science policy instruments available in each country, it is important to examine each country's support for Business Expenditure on Research and Development (BERD). The section provides a high-level overview of government support for firm-level R&D and innovation in each country. As such, this section offers an 'at a glance' perspective of the countries in question, before delving into much greater detail on the specific nature of the innovation and science policy instruments in each country.

Figure 1a shows the level of spending on BERD in each country between 2007 and 2017. As expected, the larger, innovation leader countries allocate the greatest level of financial support to BERD. This graph serves to offer context regarding the amount each country invests on BERD. It should be noted that to offer deeper insight, the exact makeup of this spending should be broken down further and normalised to account for the size disparities between countries.




*Source: (OECD, 2020c). Date Accessed: June 10th 2020. Converted into Euros by Authors. Israel data not available. Singapore data only available up until 2011.*

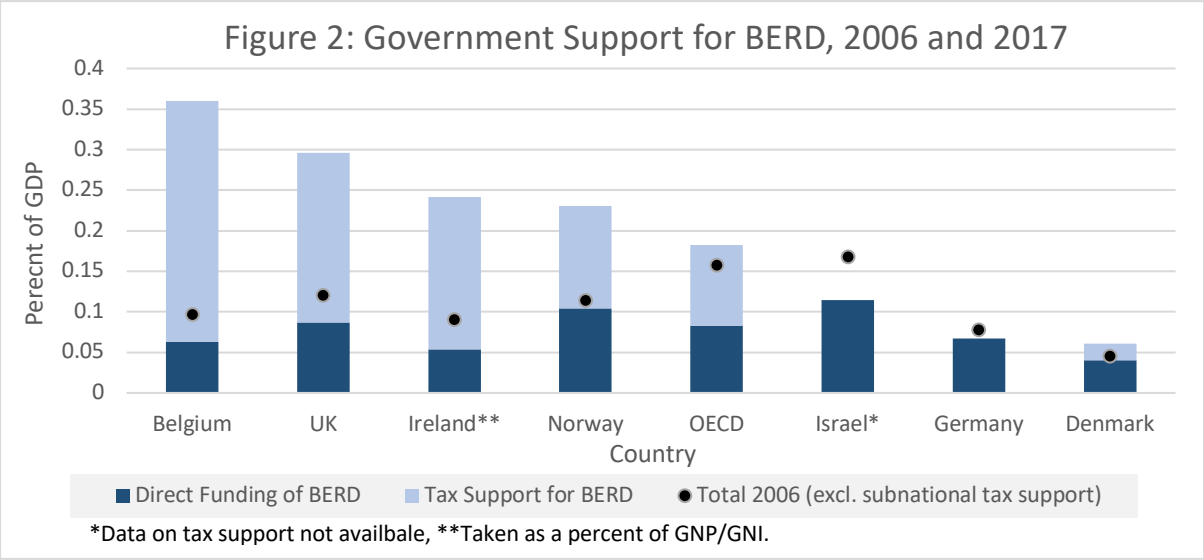
Figure 1b offers a normalised view of BERD relative to a country's GDP. In Figure 1b, Ireland is a somewhat unique case, as there has been much debate on whether GDP is the most appropriate measure for economic activity (Conroy, 2015; Deli et al., 2016). It has been argued that Ireland's GDP is not an accurate measure of economic activity due to the amount of Multinational Corporations (MNCs) present in the country, who repatriate profits outside of Ireland (Argandoña, 2016; Joebges, 2017). To overcome this issue, Ireland's support for BERD is measured as a percentage of Gross National Product (GNP) (Central Statistics Office, 2020b). Figure 1b shows that placing BERD relative to GDP for each country, there is an opportunity for useful and interesting comparisons to be made across countries that were not initially obvious when looking at the absolute levels of BERD.




*Source: (OECD, 2020c). Date Accessed: June 10th 2020. Calculated as a percentage of GDP (GNP for Ireland) by Authors. Data Source: (Central Statistics Office, 2020a; Department of Statistics Singapore, 2020; Office of National Statistics, 2020; Statistics Denmark, 2020; Statistics Norway, 2020; The Federal Statistics Office, 2020; The World Bank, 2020). Israel data not available. Singapore data only available up until 2011.*

Figure 2 demonstrates the breakdown of direct government support (e.g. R&D grants) and indirect government support (e.g. R&D tax credits) for BERD in 2006 and 2017 as a percentage of GDP. The years 2006 and 2017 offer an overview of how each country's BERD support has changed over time. The respective years facilitates a comparison of each country's position before, and after the 2007 global financial crisis. During the recession which followed, government's may not have been able to allocate the same level of resources to BERD as they would have otherwise (OECD, 2009). In turn, focusing on the year 2017 allows for a sufficient amount of time for countries to have recovered.

In Figure 2 the breakdown of public support between direct funding for BERD and indirect support through R&D tax incentives can be observed. This offers an overview of how each country chooses to support BERD.



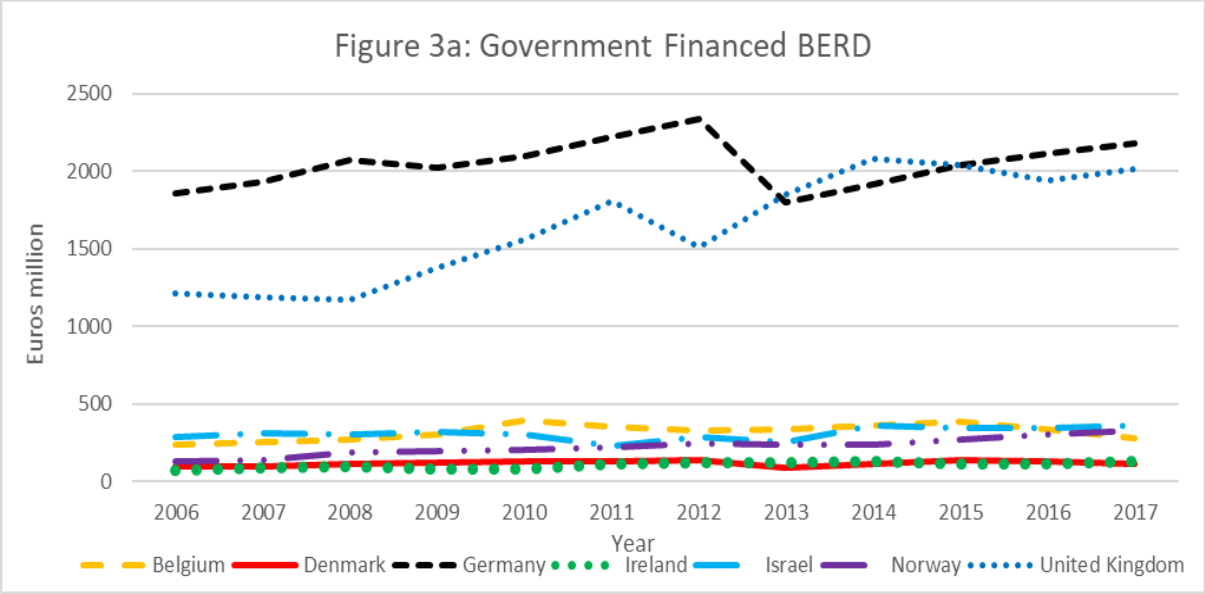

*Source: (OECD, 2020b). Date Accessed: June 10th 2020. Notes: Public support as a percentage of GDP on Y-axis. Ireland is presented as a percent of GNP. Data for Singapore was not available. Israel's indirect support data was not available. Germany did not offer an R&D tax credit until January 1st 2020; data for 2020 is currently not available. Direct support is defined as: grants, loans, and public procurement. Indirect support is defined as: tax incentives. Source: OECD, R&D Tax Incentive Indicators (available: http://oe.cd/rdtax) and Main Science and Technology Indicators (available: www.oecd.org/sti/msti.htm), accessed: June 2020.*

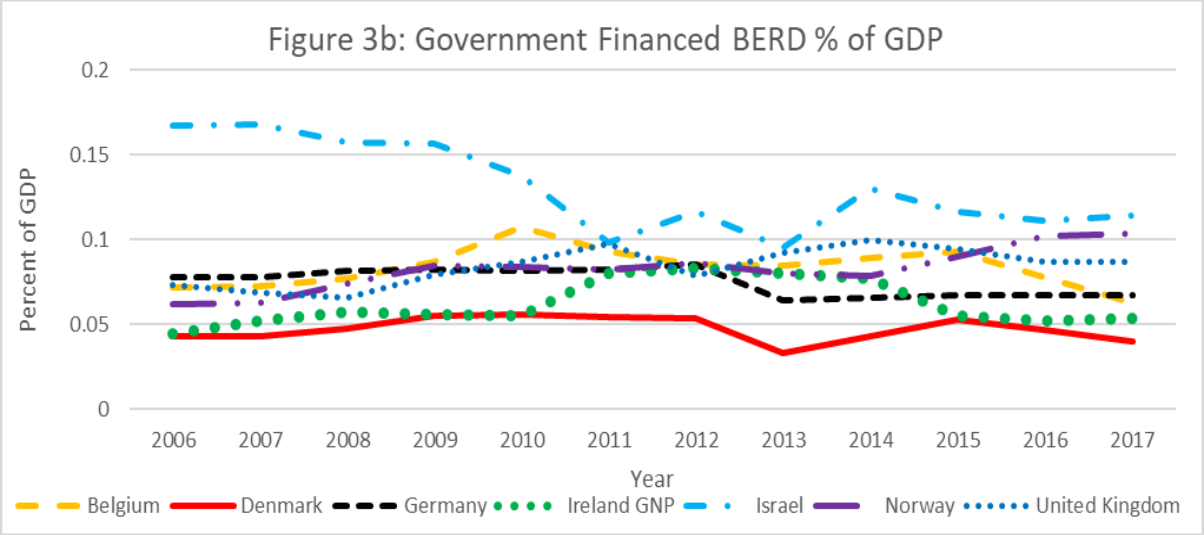
In terms of funding firm-level R&D projects, Griliches (1979, p. 109-110) stipulated that "a dollar is a dollar irrespective of source (unless there are explicit expenditures and accounting rules connected with the use of federal money which may lead to inefficiencies)". However, Figure 2 demonstrates that countries place a different emphasis on direct funding through R&D grants versus indirect support through R&D tax credits.

Figure 2 shows that in 2017, Belgium allocated more funding to BERD than any other country (relative to GDP) in this report. Belgium's overall level of support increased significantly since 2006, with a distinct emphasis on indirect support. Similarly, Ireland's public support for firm-level R&D has increased significantly since 2006. The majority of Ireland's public support for BERD comes through the R&D tax credit (Appelt et al., 2019). Belgium, the UK, Ireland, and Norway all had support that was above the Organisation for Economic Cooperation and Development (OECD) average in 2017. Moreover, the majority of the countries included in this report all have a higher percentage of indirect support than direct support. Germany is an outlier as all its support is classified solely as direct funding.

However, as of January 2020, the German government has chosen to introduce an R&D tax credit programme (BDO Germany, 2020). Denmark has the lowest overall level of support for firm-level R&D, relative to GDP. In addition, Denmark is the only country included in the report that that focuses more on direct support than indirect support.

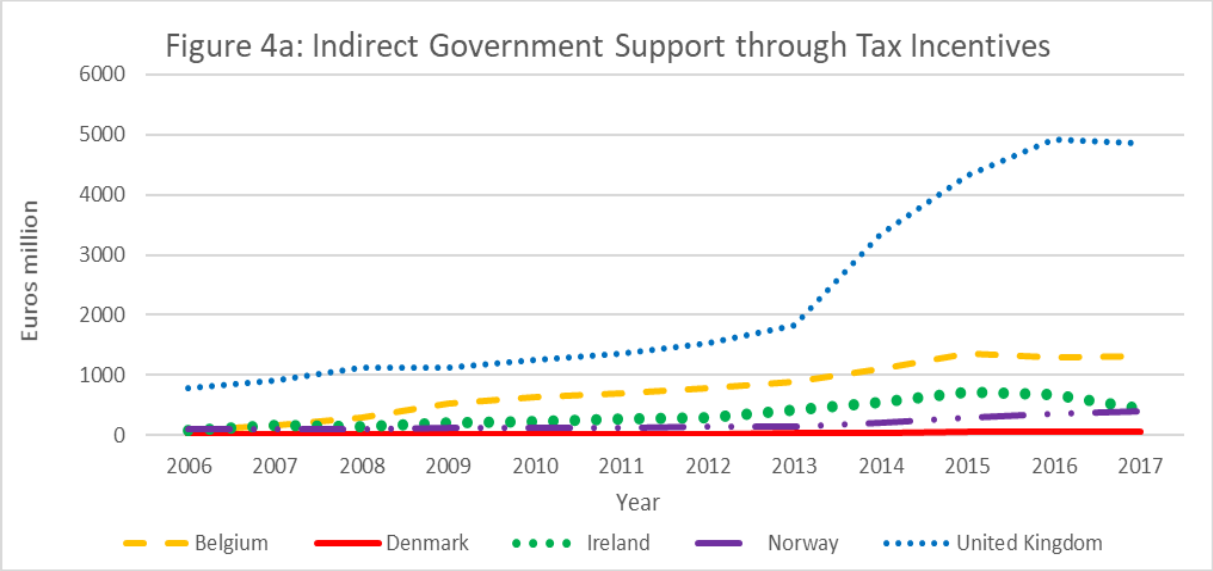
Building on the information provided in Figure 2, Figures 3a, 3b, 4a and 4b below illustrate how government direct and indirect support has evolved over time.

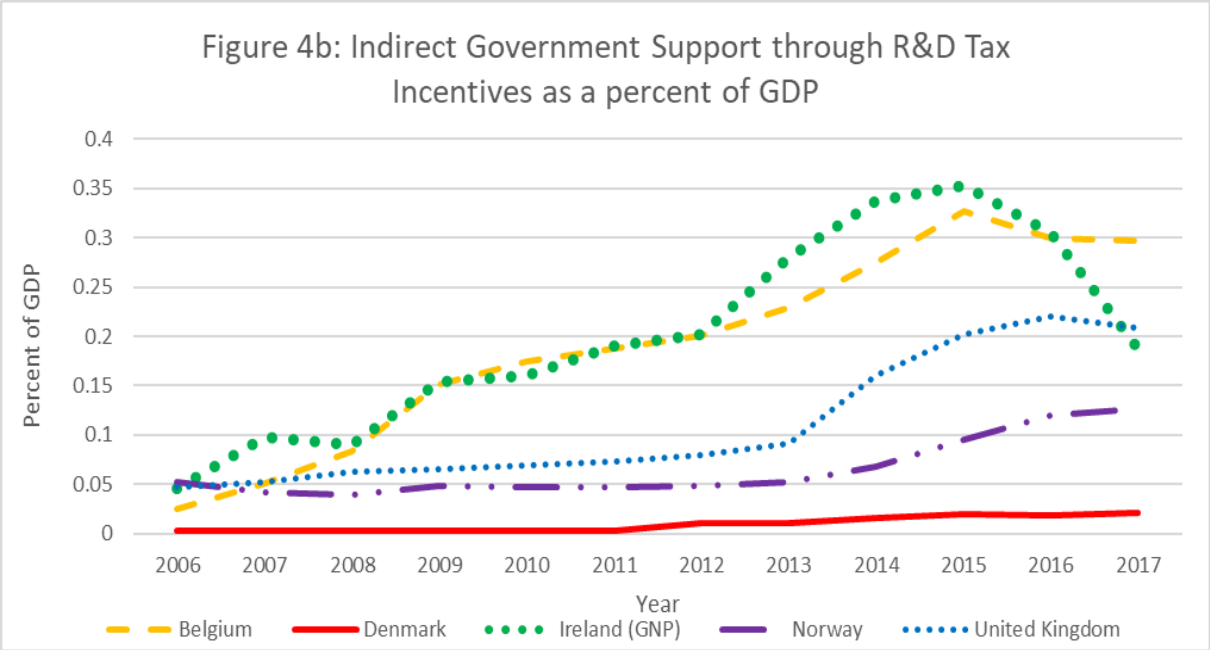



*Source: (OECD, 2020e). Date Accessed: June 1st 2020. Converted in Euro by Authors. Germany did not have an R&D tax credit programme until January 1st 2020. Israel and Singapore data was not available. Source: (CSO, 2020a). Date Accessed: June 17th 2020.*

As expected, Figure 3a highlights that the two larger economies, Germany and the UK, invest a nominally significantly higher amount in direct funding for BERD. Relative to the other countries, both Denmark and Ireland's direct support for BERD is low. However, given that both are small economies, absolute values may not provide all of the necessary information. As Figure 3b shows, when direct government financed BERD is placed relative to GDP for each country, there is an opportunity for useful and interesting comparisons to be made across countries.




*Source: (OECD, 2020e). Date Accessed: June 1st 2020. Converted into Euro by Authors. Germany did not have an R&D tax credit programme until January 1st 2020. Israel and Singapore data was not available. Source: (CSO, 2020a). Date Accessed: June 17th 2020.*

Figure 4a shows the indirect support each country's national government provides through R&D tax incentives. Figure 4a demonstrates that the UK dedicates a significantly larger nominal amount in indirect support, relative to the other countries included. It is also clear that there has been major growth in the use of indirect support in the UK, Ireland and Belgium since 2013. In Figure 4b, the level of indirect support for BERD is presented relative to GDP, highlighting that both Belgium and Ireland place a significant emphasis on indirect support relative to the size of their economies.

In summary, both Figure 4a and 4b demonstrate that indirect support tends to dominate direct support for firm-level R&D in most countries. However, there are several notable differences across countries.

## Section 2. Country-specific details on innovation and science policy instruments

Following the overview of government support for firm-level Research and Development (R&D) provided in Section 1, this section outlines the information on each innovation and science policy instrument that will be analysed. The innovation and science policy instruments available to firms in each country will first be examined under the following headings:

- The year the innovation/science policy instrument was first introduced
- Which funding agency/government body is responsible for the innovation/science policy instruments
- What eligibility criteria does each instrument have
- How much funding has been allocated to firms by means of the instrument
- How many firms have claimed/received the instrument

The information captured here gives a baseline understanding of the respective policy instruments. To build on this, a more nuanced analysis is required to understand the precise nature of each policy instrument's design features. The information captured in this section (detailed in Table 1 below) includes policy instrument stringency, level of support, predictability, flexibility, funding and scale. By analysing policy instruments under these headings, a greater understanding of the policy instruments can be derived. By doing so, differences between instruments that initially appear to be nominally similar can be observed. Table 1 provides detailed explanations of the headings included in the second section of the analysis.

**Table 1: Definitions of Innovation and Science Policy Instrument Design Features**

| Design feature | Definition of policy instrument design features |
|---|---|
| **Stringency** | Refers to how a policy instrument is assessed once it has been awarded. Stringency involves the degree to which governments/funding agencies enforce regulations on firms. To provide an illustrative example of stringency, most countries R&D tax credit programmes can be quite stringent with regard to the specific definition of what R&D qualifies for tax credit relief. If a firm meets that minimum requirement, it can avail of the tax credit. If the firm does not meet the minimum requirement, it cannot avail of the tax credit. This report places each policy instrument into one of three categories to demonstrate its level of stringency: 1) stringent, 2) relatively stringent, and 3) low stringency. |
| **Level of Support** | Defined as the monetary value of financial incentives provided to firms. To demonstrate this point, one specific R&D grant may be worth up to a maximum of €500,000, while another may be worth up to €10,000. The current report places instruments into one of three categories depending on level of support: 1) high, 2) medium, and 3) low. |
| **Predictability** | Represents the degree of certainty associated with a policy instrument in terms of its availability and its future development. For example, a policy instrument may have been consistently available for the past ten years. However, in each of these years, the eligibility criteria, level of funding, and the specific projects firms can employ the support for, may change significantly. To be predictable, a policy instrument must be available for a significant length of time and have experienced relatively few major changes in this time. This report places policy instruments into three categories depending on their level of predictability: 1) predictable, 2) relatively predictable, and 3) less predictable. |

**Table 1: Definitions of Innovation and Science Policy Instrument Design Features (continued)**

| Design feature | Definition of policy instrument design features |
|---|---|
| **Flexibility** | Flexibility is inherently linked with the concept of stringency. It refers to how much freedom firms have in choosing their preferred way of carrying out a funded R&D/innovation project, while achieving stringency compliance. Stringency concerns what minimum standards firms have to comply with to avail of the policy instrument. Flexibility concerns the degree to which elements can be changed in the funded project. The R&D tax credit schemes available in most countries provide a useful example of flexibility. R&D tax credits have strict requirements for what qualifies as R&D. However, once these requirements are met, firms can claim R&D tax credits for any form of R&D or any R&D project. The latter thus allows a great degree of flexibility in how this policy instrument is used. This document places instruments into three categories depending on their level of flexibility: 1) flexible, 2) relatively flexible, and 3) less flexible. |
| **Differentiation** | Differentiation relates to how the same policy instrument can apply to different firms or projects in different ways, depending on the specific characteristics of the firm and/or project. Some policy instruments may be targeted at firms with specific characteristics that are a focus for policymakers. For example, an R&D grant may be available to all firms in a country. However, Small and Medium-sized Enterprises (SMEs) in certain geographical regions may be eligible to receive higher levels of funding than large firms or other SMEs located elsewhere. In this instance, the R&D grant is differentiated as it can apply to different firms in different ways. This report places policy instruments into three categories depending on their level of differentiation: 1) differentiated, 2) relatively differentiated, and 3) less differentiated. |
| **Depth of Instrument** | Depth refers to how the instrument is designed to affect firms across the innovation value chain, from knowledge creation to knowledge transformation and exploitation. It refers to whether the instrument supports the creation of new knowledge, or if it focused more on bringing an innovation to market. To provide an illustrative example, an R&D grant for basic research has depth, as its focuses on creating new knowledge. This report places instruments into three categories depending on their depth: 1) deep; 2) relatively deep; and 3) less deep. |
| **Note:** | The definitions for policy instrument design features Table 1 are adapted from Rogge and Reichardt (2016). |

## Section 3. Cross-country comparison of innovation and science policy instruments

This section examines the innovation and science policy instruments available to firms in each of the eight countries. The funding agencies and/or government bodies responsible for each policy instrument are outlined at the beginning of each country-specific sub-section. This provides context for how each country implements its set of policy instruments. Following this, each policy instrument is detailed in terms of its characteristics and design features.

This analysis for each country is split across two tables. The first table addresses general characteristics relating to the innovation and science policy instruments outlined above (e.g. eligibility requirements). The second table examines the design features of each innovation and science policy instrument under the headings outlined in Table 1. Together, the two tables provided for each country provide a significant level of detail on each innovation and science policy instrument available to firms in each country.

## Section 3.1 Ireland

There are four main funding agencies/government bodies responsible for innovation and science policy instruments at the firm-level in Ireland:

1. Enterprise Ireland (EI)

Enterprise Ireland (EI) is the national funding agency responsible for developing and growing indigenous/domestic Irish firms in world markets. EI prioritises increased export sales by Irish firms, as high foreign demand for Irish goods and services are considered key factors in generating and sustaining Irish jobs (EI, 2020a). EI views innovation as crucial for Irish firms to remain competitive in the global market (Creaner, 2019). EI implements many policy instruments to support firm-level R&D and innovation[1].

2. Industrial Development Agency (IDA) Ireland

Since the 1958 *First Programme for Economic Expansion*, the Irish government has had a specific focus on attracting Foreign Direct Investment (FDI) to develop the domestic economy (IDA Ireland, 2019). IDA Ireland is the national funding agency responsible for attracting investment into Ireland by foreign-owned firms (IDA Ireland, 2020a). Relative to EI, IDA Ireland implements a smaller number of policy instruments which target a smaller pool of firms (IDA Ireland, 2020b). However, the funding associated with these policy instruments is much larger than that employed by EI, reflecting the large-scale nature of the R&D projects undertaken by foreign-owned firms in Ireland (IDA Ireland, 2020b).

3. Science Foundation Ireland

*Science Foundation Ireland* (SFI) invests in academic researchers and research teams who it deems most likely to generate new knowledge, leading edge technologies and competitive enterprises in Science, Technology, Engineering, and Mathematics (STEM) areas (SFI, 2020a). SFI supports oriented basic research and applied research. Unlike EI or IDA, SFI does not directly fund firm-level R&D projects. SFI funds research centres in Ireland which are mandated to collaborate with firms. Therefore, SFI provides indirect support for firm-level R&D and innovation[2].

4. Irish Revenue Commissioners

The final organisation covered for Ireland is the *Irish Revenue Commissioners*. The Revenue Commissioners is unlike the organisations discussed above, as it is not a funding agency. The Revenue Commissioner's primary role is to collect taxes and duties, and the implementation of customs controls (Irish Revenue Commissioners, 2020a). The Revenue Commissioners also provides policy advice on taxation issues. The Revenue Commissioners administers the largest policy instrument targeted at firm-level innovation and science in Ireland, the R&D tax credit. This is the largest policy instrument in terms of the amount of (indirect) public funding and the number of firms that claim the tax credit each year (Department of Finance, 2016).

[1]For further information on EI's innovation and science policy instruments, see https://www.enterprise-ireland.com/en/Research-Innovation/Companies/R-D-Funding/Funding-for-independant-and-collaborative-R-D.html.
[2] For further information on SFI's science funding policy, see https://www.sfi.ie/funding/

**Table 2: Innovation and science policy instruments available to firms in Ireland (2007-2020)**

| Policy Instrument / Intervention | Enterprise Ireland R&D Fund (First introduced in 2008; Evolved from Enterprise Ireland Research Technology and Innovation Scheme in 2008) |
|---|---|
| ***Agency responsible*** | Enterprise Ireland (EI) |
| ***Criteria / Eligibility Requirements*** | Available to all registered Irish-based firms with positive earnings. Supports *R&D projects* and *Business Innovation projects*, ranging in size from €300,000 to €3 million. ***R&D projects***: resolve technical challenges to develop new products, processes, or services. ***Business Innovation projects***: implementation of new services delivery, production methods, or substantive business model change. ***R&D Projects*** – **Max Grant:** €650,000. **Max grant rate:** Small firms (less than 50 employees and annual turnover/balance sheet of €10 million or less) 45%, Medium firms (less than 250 employees and annual turnover of €50 million or less or balance sheet €43 million or less) 35%, and Large firms (exceed the limits of medium-sized firm – more 250 employees and annual turnover greater than €50 million) 25%. ***Business Innovation*** – **Max Grant:** €150,000. **Max grant rate** – 50% for all firms. Collaboration bonus of up to 15% if two firms collaborate. Maximum is still 50% with bonus included. Small Project Fund offers a grant for projects with costs up to €150,000. |
| ***What is the support for?*** | Aimed at **larger R&D projects**. Supports new or substantially improved products, processes, services, and organisational changes which will increase a firm's competitiveness in their target market. Project must involve the resolution of technical challenges, be non-routine and represent a 'step-up' for a firm's RD&I capability. **Small Project Fund** targets firms that have modest R&D ambitions or are relatively new to R&D activities. |
| ***Funding and scale*** | €59.6 million, 251 firms (2013 – 2016) |

| Policy Instrument / Intervention | Enterprise Ireland Commercialisation Fund (First introduced in 2003) |
|---|---|
| ***Agency responsible*** | Enterprise Ireland (EI) |
| ***Criteria / Eligibility Requirements*** | Available to all researchers in Higher Education Institutions (HEIs) and Research Performing Organisations (RPOs) in Ireland. Firms cannot apply. Project costs are typically **between €80,000 and €350,000**, but alternative costs are considered on a case-by-case basis. EI also offers the Commercial Case Feasibility Grant as part of the Commercialisation Fund, which allows firms to scope and develop (up to 3 months) the commercial case for an innovation project. Typical amounts are **between €10,000 and €15,000**. |
| ***What is the support for*** | Supports non-industry researchers in **science and engineering** to develop technology that leads to the creation of start-up firms and/or the generation or licensing of technologies to firms to bring products/services to market. |
| ***Funding and scale*** | €144.2 million, 895 projects (2003 – 2009) |

| Policy Instrument / Intervention | Innovation Voucher (First introduced in 2007) |
|---|---|
| ***Agency responsible*** | Enterprise Ireland (EI) and IDA Ireland |
| ***Criteria / Eligibility Requirements*** | Available to all **Small and Medium-sized Enterprises (SMEs)** in Ireland. Some specific sectors excluded, such as agriculture and not-for-profit. |
| ***What is the support for?*** | **€5,000 voucher** to incentivise collaboration and build links between Ireland's Higher Education Institutions (HEIs) and SMEs. SMEs can match the €5,000 voucher with up to €5,000 of their own funding to avail of a **50-50 co-funded** fast-track application process. |
| ***Funding and scale*** | €9.9 million, 1,638 SMEs (2007 – 2012) |

| Policy Instrument / Intervention | Innovation Partnership Programme (First introduced in 2003) |
|---|---|
| ***Agency responsible*** | Enterprise Ireland (EI) |
| ***Criteria / Eligibility Requirements*** | Available to all manufacturing and/or internationally traded services firms based in Ireland, who wish to collaborate with Higher Education Institutions (HEIs) based in Ireland. ***Innovation Partnerships*** provide grants from **40% to 80%** towards eligible costs of a research project. Grant paid directly to the HEI on verified expenses. Funding typically **does not exceed €200,000**. Different supports are available depending on the firm size and project type. Medium-sized firms: less than 250 employees and annual turnover of €50 million or less, or balance sheet €43 million or less. Large firms: exceed the limits of medium-sized firm – more 250 employees and annual turnover greater than €50 million. ***Industrial Collaborative Research:*** Maximum Grant Rate – Small firms: 80%, Medium firms: 75%, Large firms: 65%. ***Experimental Collaborative Development:*** Maximum Grant Rate – Small firms: 60%, Medium firms: 50%, Large firms: 40%. Grant funding limited to €200,000. |
| ***What is the support for?*** | Facilitates **collaboration between firms and academics** in specific research fields. Provides **up to 80%** of the cost of research project between a firm and HEI. Aim is to develop new and improved products, processes, or services, or generate new knowledge and know-how. |
| ***Funding and scale*** | €22.6 million, 145 partnerships funded (2004 – 2006) |

**Table 2: Innovation and science policy instruments available to firms in Ireland (2007-2020) (continued [1])**

| Policy Instrument / Intervention | Technology Gateway (First introduced in 2013; Evolved from Applied Research Enhancement programme) |
|---|---|
| ***Agency responsible*** | Enterprise Ireland (EI) |
| ***Criteria / Eligibility Requirements*** | Available to all firms based in Ireland. EI funds a network of Technology Gateways based on the campuses of Institutes of Technology (IoTs). This network facilitates collaboration between firms and academics in specific research fields. Technology Gateways focus on Information Communication Technology (ICT) and software, materials, bio-medical devices and bio-life sciences and pharmaceuticals. Collaborative project size varies between small, short-term projects **(€5-10,000, usually funded through Innovation Vouchers)** to larger projects **up to €200,000 (usually funded through Innovation Partnerships)**. |
| ***What is the support for?*** | Facilitates collaboration between firms and academics in specific research fields on near-to-market innovation projects. Provides an access point for wider resources in the Irish research infrastructure. Focus on industry-relevant applied research, development and providing technical solutions. Research agenda is set in consultation with industry, to **identify industry needs**. |
| ***Funding and scale*** | €30 million, 1,500 (2013 – 2019) |

| Policy Instrument / Intervention | Technology Centre |
|---|---|
| ***Agency responsible*** | Enterprise Ireland (EI) & IDA Ireland |
| ***Criteria / Eligibility Requirements*** | Available to all firms based in Ireland. ***Technology Centres*** have a specific mandate to pursue an industry-led research agenda. Focus on short-to-medium term, problem-oriented research. To work with ***Technology Centres***, firms must be R&D-active, or have committed to increasing their R&D performance, and have a clear strategic plan to engage in R&D. Focus on applied research agenda. |
| ***What is the support for?*** | Facilitates **collaboration between firms and academics** on market focused strategic R&D projects. Technology Centres are collaborative bodies, led by industry. Aim to generate economic value from publicly funded research. |
| ***Funding and scale*** | Exact funding and scale unavailable. |

| Policy Instrument / Intervention | Small Business Innovation Research (SBIR; First introduced in 2008) |
|---|---|
| ***Agency responsible*** | Enterprise Ireland (EI) |
| ***Criteria / Eligibility Requirements*** | Available to all firms based in Ireland. Particularly suited to SMEs. It provides **100% funding** for firms to conduct research and test potential innovations. Funding is competitive. Exact funding allocation per firm depends on the challenge applied for, and the challenge stage. Each challenge has different total funding available. Firms receive funding in both **Phase 1** (technical feasibility study) and **Phase 2** (prototype). Firms must be selected to progress from Phase 1 to Phase 2. |
| ***What is the support for?*** | Encourages collaboration between Irish public sector and private sector technology-rich firms. Explores solutions, through *SBIR Challenges*. Challenges divided into **two Phases**: Phase 1 – up to 6 firms undertake technical feasibility studies to understand the challenge and identify solutions to solve a public sector organisation's problem. Phase 2 – smaller number of firms prototype a specific project, through extensive R&D. |
| ***Funding and scale*** | Exact funding and scale unavailable. €1.14 million SBIR Challenge (March 2020) |

| Policy Instrument / Intervention | Tailored Company Expansion Package (including R&D) |
|---|---|
| ***Agency responsible*** | Enterprise Ireland (EI) |
| ***Criteria / Eligibility Requirements*** | Available to all **manufacturing or internationally traded services firms** based in Ireland, employing ten or more people. Supports new or incremental investment in: Capital assets and job creation, R&D, Training, Management Development and Consultancy. Typically, funding for job creation and capital is in the form of redeemable preference shares. Grant funding for recruitment of key managers and training/management development. Funding for R&D is in the form of grant/preference shares. |
| ***What is the support for?*** | Supports firms undertaking or planning to undertake an **ambitious expansion** that will create employment and grow firm sales in international markets (i.e. exports). Supports post-2008 enabled SMEs to access funding when traditional commercial funding markets had become unavailable due to the global financial crisis. |
| ***Funding and scale*** | €9.1 million, 41 firms (2014) |

**Table 2: Innovation and science policy instruments available to firms in Ireland (2007-2020) (continued [2])**

| Policy Instrument / Intervention | Innovative High Potential Start Up (HPSU; First introduced in 2008) |
|---|---|
| ***Agency responsible*** | Enterprise Ireland (EI) |
| ***Criteria / Eligibility Requirements*** | Available to all start-up firms (usually with less than ten employees) and small enterprises that have been in existence for less than five years. Based on a venture capital-style funding model with several investment rounds. Firms with no trading record: at least 15% of total operating costs must relate to R&D expenses in the current fiscal year when applying. Firms with a trading record: at least 15% of total operating costs must relate to R&D expenses, in at least one of the last three years when applying. Firms must have an innovative business plan for development of products, services, or processes. EI commits up to 50% of investment required per investment round. Average funding approved is **€200,000 in Seed phase**. Additional sums based on achieving agreed milestones. The maximum equity funding by EI is **€1 million over three years** (€1.25 million for regions outside Dublin). |
| ***What is the support for*** | Supports start-up and development costs of HPSU firms. Encourages the establishment and development of **innovation-led HPSUs with strong export-focus**. Investment goes to achieving an overall business plan, not funding discrete elements of a business plan, such as R&D or employment creation. |
| ***Funding and scale*** | €12.55 million, 55 firms (2014) |

| Policy Instrument / Intervention | Enterprise Ireland Technical Feasibility Fund |
|---|---|
| ***Agency responsible*** | Enterprise Ireland (EI) |
| ***Criteria / Eligibility Requirements*** | Available to all firms based in Ireland. Provides grants up to **50% of eligible costs**, up to **€15,000** to conduct a feasibility study for an R&D/innovation project. Firms can only ever make two claims against this support. |
| ***What is the support for?*** | Supports firms to investigate the **feasibility of developing** a new product, process, technology, or service offering. |
| ***Funding and scale*** | €1.28 million, 49 firms (2014) |

| Policy Instrument / Intervention | European Space Agency (ESA) Project (First introduced in 1975) |
|---|---|
| ***Agency responsible*** | Enterprise Ireland (EI) |
| ***Criteria / Eligibility Requirements*** | Available to all firms in Ireland. Firms apply for *European Space Agency* (ESA) contracts under a **competitive tendering process.** The availability of contracts depends on the scope of the procurement underway but is limited by Ireland's financial contribution to the specific ESA programme. Irish industrial participation is typically in the engineering, aerospace, software, electronics, optoelectronics, and telecommunications sectors. |
| ***What is the support for?*** | Supports Irish firms to **successfully bid** for ESA contracts. Provides a source of expertise for Irish firms in developing and executing space strategies. Acts as a point of reference for the international space industry when identifying relevant sources of space-related expertise within Ireland. |
| ***Funding and scale*** | €19.3 million in ESA contracts (2019), 110 firms (2000 – 2018). |

| Policy Instrument / Intervention | Exploring Innovation Grants (Formerly the Technical Feasibility Study Grant) |
|---|---|
| ***Agency responsible*** | Enterprise Ireland (EI) |
| ***Criteria / Eligibility Requirements*** | Available to all manufacturing or services firms based in Ireland, employing ten or more people. Maximum grants are 50% of eligible expenditure, up to a **maximum grant** of **€35,000**. Applications are considered on a case-by-case basis. Level of funding determined based on assessment of: 1) the merits of providing grant support to the activity set out in the application; 2) the need for financial support; 3) previous funding provided to the firm; and 4) potential for employment and sales growth. |
| ***What is the support for?*** | Support improved planning of **R&D, innovation, or international collaboration projects**. This includes: Encouraging firms to engage in strategic thinking about disruptive technologies; encouraging firms to look for external inspiration and guidance; investigating if solutions are available from HEIs; carrying out prototype development to assist in the evaluation of project options; and analysing project commercial feasibility. |
| ***Funding and scale*** | Exact funding and scale unavailable. Offers support worth up to €35,000 to firms. |

**Table 2: Innovation and science policy instruments available to firms in Ireland (2007-2020) (continued [3])**

| Policy Instrument / Intervention | Agile Innovation Fund (First introduced in 2017) |
|---|---|
| ***Agency responsible*** | Enterprise Ireland (EI) |
| ***Criteria / Eligibility Requirements*** | Available to all firms in Ireland, with positive earnings, who are: new to R&D, operating in short product life cycles, and/or undertaking small/short projects. Grant support is provided for projects **up to €300,000**. Grant rates are from 25% to 50%, dependent on a firm size, project type, and inclusion of collaboration. Small firms: less than 50 employees and annual turnover/balance sheet of €10 million or less. Medium firms: less than 250 employees and annual turnover of €50 million or less or balance sheet €43 million or less. Large firms exceed the limits of medium-sized firm – more 250 employees and annual turnover greater than €50 million. **Agile Innovation Projects:** Max grant rate – Small firms 45%, Medium firms 35%, and Large firms 25%. **R&D and Agile with Collaboration**: Maximum grant rate – Small firms 50%, Medium firms 50%, Large firms 40%. **Business Innovation:** Max grant rate – Small firms 50%, Medium firms 50%, Large firms are *not eligible*. |
| ***What is the support for?*** | Supports development of new or substantially improved products, services or processes, where total project cost is less than €300,000. Two project categories are eligible: **Agile Innovation** projects supports firms in sectors with rapid design cycles to maintain their technology position. **Business Innovation** projects involve the implementation of new services delivery, production methods or substantive changes to a firm's business model. |
| ***Funding Allocation*** | Exact funding and scale unavailable. Offers support worth up to €300,000 to firms. |

| Policy Instrument / Intervention | Intellectual Property Assistance Scheme (First introduced in 1998; Introduced HEI Patent Fund in 2004; This instrument was phased out in 2009) |
|---|---|
| ***Agency responsible*** | Enterprise Ireland (EI) |
| ***Criteria / Eligibility Requirements*** | The Intellectual Property Assistance Scheme is divided into two programmes. **1) HEI Patent Fund:** Available to researchers in HEIs seeking to commercialise academic research (e.g. spin out firms). The HEI Patent Fund grants typically cover 100% of eligible costs of patenting activities. Funding levels dependent on the application stage. Stage 1 offers support for up to €7,000. Stage 2 offers support for up to €20,000. Stage 3 offers support for up to €50,000. **2) Industry Patent Fund:** Available to indigenous Irish firms. Covers a proportion of patent filing costs for applicants with capacity and competence to commercialise the invention. Level of support differs depending on the application stage. Stage 1-advice is offered. Stage 2-funding for patent submission is offered. Stage 3-funding for up to a limit of €20,000 is offered, but alternative costs are considered on a case-by-case basis. |
| ***What is the support for?*** | Supports firms, entrepreneurs, innovators, and researchers **protecting their Intellectual Property (IP)** with commercial potential, primarily through the provision of financial supports for patenting. Provides information to firms, entrepreneurs, innovators and researchers on IP protection, management and exploitation. |
| ***Funding Allocation*** | **HEI Patent:** €6.18 million, 647 applications (2005 – 2009)<br>**Industry Patent:** €809,000, 71 applications (2005 – 2009) |

| Policy Instrument / Intervention | IDA R&D & Innovation Grant Aid (First introduced in 2000; Evolved from IDA R&D Capability Fund) |
|---|---|
| ***Agency responsible*** | IDA Ireland |
| ***Criteria / Eligibility Requirements*** | Available to foreign-owned firms based in Ireland, to perform R&D and introduce innovative products, processes and services. Support available for: 30% personnel costs, 10% consultancy costs (no travel/subsistence), 20% materials. **Maximum grant** amounts can vary depending on the project. Divided into three categories: 1) up to €500,000, 2) €500,000 to €7.5 million, and 3) greater than €7.5 million. |
| ***What is the support for?*** | Aims to increase the number of foreign-owned firms **performing R&D in Ireland**, the scale of investment in R&D in Irish operations, and number of foreign-owned firms in Ireland performing R&D for the first time. |
| ***Funding Allocation*** | €852 million, 566 firms (2006 – 2016) |

| Policy Instrument / Intervention | IDA R&D Feasibility Grant (First introduced prior to 2002) |
|---|---|
| ***Agency responsible*** | IDA Ireland |
| ***Criteria / Eligibility Requirements*** | Available to foreign-owned firms based in Ireland. Provides grant support up to a **maximum** of €250,000 or 50% of eligible expenditure. |
| ***What is the support for*** | Investigate the feasibility of developing a new product, process, technology or service offering. Designed to **support exploratory work** required to develop and justify longer term and more sustainable Research, Development and Innovation (RD&I) programme within IDA client firms. |
| ***Funding Allocation*** | €17.7 million, 131 firms (2006 – 2016) |

**Table 2: Innovation and science policy instruments available to firms in Ireland (2007-2020) (continued [4])**

| Policy Instrument / Intervention | SFI Centres for Science, Engineering, and Technology (CSETs) (First introduced in 2003; Evolved into SFI Research Centres Programme in 2012) |
|---|---|
| ***Agency responsible*** | Science Foundation Ireland (SFI) |
| ***Criteria / Eligibility Requirements*** | Available to all firms (based in Ireland and outside of Ireland). SFI provide funding to establish CSETs on the campuses of Irish Higher Education Institutions (HEIs). CSETs then collaborate with firms on research projects (SFI does not directly fund firms). Industry partners are expected to share **20% of the cost** of each research project. It is usually (though not necessarily) a pre-requisite for collaborating firms to be at a minimum R&D-active, as collaborations focus on **basic and applied research** (as opposed to development). |
| ***What is the support for?*** | Developing partnerships across academia and industry to address crucial research questions. Conduct high quality **academic research, oriented** to industry needs and applications. Foster development of new and existing Irish-based technology firms. Focused on longer-term, user-oriented basic research and applied research. |
| ***Funding Allocation*** | €225 million, 10 centres CSETs (2003 -2012) |

| Policy Instrument / Intervention | SFI Strategic Research Clusters (SRCs; First introduced in 2007; Evolved into SFI Research Centres Programme in 2012) |
|---|---|
| ***Agency responsible*** | Science Foundation Ireland (SFI) |
| ***Criteria / Eligibility Requirements*** | Available to all firms (based in Ireland and outside of Ireland). All SRCs are targeted at **biotechnology and ICT**, with one exception in financial mathematics. Funding from SFI to establish SRCs on the campuses of Irish HEIs. SRCs then collaborate with firms on research projects (SFI does not directly fund firms). Requires researchers from different HEIs to work together within the clusters. SRCs did not require industry involvement at the outset, but most involved industry partners. Contribution from industry in the SRC could either be **'in kind' or 'in cash'** with both contributing to industry leverage targets. |
| ***What is the support for?*** | Fund strategic, collaborative research, on one-off projects. Aims to exploit opportunities in **science and engineering** and create clusters of internationally competitive researchers from academia and industry. Supports internationally leading investigations across disciplines to develop and strengthen Ireland's industrial base. |
| ***Funding Allocation*** | €134.5 million, 21 SRCs (2007 – 2011) |

| Policy Instrument / Intervention | SFI Research Centres (First introduced in 2012; Evolved from SRCs and CSETs) |
|---|---|
| ***Agency responsible*** | Science Foundation Ireland (SFI) |
| ***Criteria / Eligibility Requirements*** | Available to all firms (based in Ireland and outside of Ireland). Funding from SFI used to establish Research Centres on the campuses of HEIs (or renew former CSETs/SRCs post-2012). Research Centre then collaborates with firms on research projects (SFI does not directly fund firms). Firms must make a minimum 30% 'in cash' **financial contribution** and a **verifiable intellectual contribution** to all research collaborations. New industrial and academic partners and projects can be added to SFI Research Centres through the SFI Spokes programme. |
| ***What is the support for?*** | Supports research that delivers significant economic and societal impact in areas of strategic opportunity for Ireland. Research Centres link **scientists and engineers** in partnerships across academia and industry to address key research questions. Centres aim to: foster development of new and existing Irish-based technology firms; attract industry that makes potentially important contributions to Ireland and the Irish economy; and expand science and engineering educational and career opportunities in Ireland. |
| ***Funding Allocation*** | €483million (2012 - 2018), 16 centres (2012 – 2020) |

| Policy Instrument / Intervention | R&D Tax Credit (First introduced in 2004) |
|---|---|
| ***Agency responsible*** | Irish Revenue Commissioners |
| ***Criteria / Eligibility Requirements*** | Available to all firms in Ireland. Firms can claim a 25% Tax Credit on R&D-related expenditure once it meets strict criteria. **R&D activities** must include: systemic, investigative or experimental activities, be in the field of science or technology, involve basic research, applied research, and/or experimental development, seek to make scientific or technological advancement, involve the resolution of scientific or technological uncertainty. |
| ***What is the support for?*** | Reduces the cost of performing R&D, thus providing **indirect support** for any R&D activities (as long as the expenditure qualifies as R&D, based on the Revenue Commissioners' eligibility criteria). |
| ***Funding Allocation*** | €3.6 billion, 11,272 firms (2007 – 2016) |

**Sources of information used in compiling Table 2: Department of Business, Enterprise, and Innovation (2018a; 2018b; 2019), Department of Finance (2013; 2016), Enterprise Ireland (2015; 2019a; 2019b; 2020a; 2020b; 2020c; 2020d; 2020e; 2020f; 2020g; 2020h; 2020i; 2020j; 2020k; 2020l; 2020m; 2020n; 2020o; 2020p; 2020q), Forfas (2013), IDA Ireland (2019; 2020a; 2020b; 2020c; 2020d), Irish Revenue Commissioners (2020a; 2020b), Myriad Associates (2019), OECD STIP Compass (2020a), Science Foundation Ireland (2009; 2020a; 2020b).**

**Table 3: Design features of innovation and science policy instruments in Ireland (2007-2020)**

| Policy Instrument / Intervention | Enterprise Ireland R&D Fund (Enterprise Ireland [EI]) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent**: *R&D projects* must address the approved issues or topics, with little scope for change. |
| ***Level of Support*** | **High**: Funding available for up to **€650,000**, based on the firm's size and the nature of the project proposed. |
| ***Predictability*** | **Predictable**: Available since 2000. Structure has slightly changed over time (e.g. brought in *Small Projects* offer in 2008 up to **€150,000**). |
| ***Flexibility*** | **Less flexible**: If project objectives cannot be achieved, advised to stop the project. Changes to approved objectives only granted in exceptional circumstances, based on a new project plan. |
| ***Differentiation*** | **Differentiated**: The maximum grant depends on the firm size, and whether the project focuses on research or development. **Small firms**: less than 50 employees and annual turnover/balance sheet of €10 million or less. **Medium firms**: less than 250 employees and annual turnover of €50 million or less or balance sheet of €43 million or less. **Large firms**: exceed the limits of medium-sized firm – more 250 employees and annual turnover greater than €50 million. |
| ***Depth*** | **Deep**: Supports the creation of new knowledge for firms to use in their innovation processes. |

| Policy Instrument / Intervention | Enterprise Ireland Commercialisation Fund (Enterprise Ireland [EI]) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent**: Project progress closely monitored, with funding released on a tranched basis. |
| ***Level of Support*** | **High**: Supports projects between **€80,000 and €350,000**. Projects outside this range are considered on a case-by-case basis. |
| ***Predictability*** | **Predictable**: Available since 2003, slight reorganisation in 2010 to put greater emphasis on identifying market application and potential from the outset of the research project. |
| ***Flexibility*** | **Relatively flexible**: The grant agreement contains technical and/or commercial deliverables which are used to assess project performance. These will be reviewed by EI to determine if funding should be made available for the next stage of multi-stage projects. |
| ***Differentiation*** | **Less differentiated**: Project costs are typically between **€80,000 and €350,000**, but alternative costs are considered on a case-by-case basis. Supports all disciplines in science and engineering fields. *Commercial Case Feasibility Grants* (typically between **€10,000 and €15,000**) help researchers assess whether ideas are feasible for longer-term projects. Provides funding for innovation development at all stages of commercialisation, where it can be commercialised as new products, services, or firms. |
| ***Depth*** | **Deep**: Supports the creation of new knowledge and bringing academic research to the market. |

| Policy Instrument / Intervention | Innovation Voucher (Enterprise Ireland [EI] and IDA Ireland) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Less stringent**: Firm must qualify as an SME under EI's definition. The approval of an application is subject to some criteria. However, the criteria are not demanding, and once the voucher is approved it is flexible in how an SME can use it in collaboration with a HEI. |
| ***Level of Support*** | **Low**: *Innovation Vouchers* are worth **€5,000** (however, Innovation Vouchers are often claimed by SMEs with low R&D, so this funding-level may be high in 'relative' terms). |
| ***Predictability*** | **Predictable**: Available since 2007; the structure of the programme has remained consistent. |
| ***Flexibility*** | **Flexible**: Once SMEs meet eligibility criteria there are many permitted uses. A 50-50 co-funded fast track application to reduce application process to four weeks is available to firms. |
| ***Differentiation*** | **Relatively differentiated**: Alongside the standard **€5,000** Innovation Voucher, SMEs can avail a **50-50 co-funded** application to reduce application process to four weeks. |
| ***Depth*** | **Relatively deep**: Builds links between SMEs and HEIs for knowledge transfer. |

**Table 3: Design features of innovation and science policy instruments in Ireland (2007-2020) (continued [1])**

| Policy Instrument / Intervention | Innovation Partnership Programme (IPP; Enterprise Ireland [EI]) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent**: Must be able to show how firms can benefit from the research in terms of growth, evolution of strategic R&D in the firm, and new knowledge creation that can be used by a firm to generate commercial advantage. All *Innovation Partnership Programme* (IPP) projects require firms to provide a minimum cash contribution of **20% of the total project cost**. |
| ***Level of Support*** | **High**: Allows for grants of up to **80%** of eligible costs; has a **€200,000** grant ceiling. |
| ***Predictability*** | **Relatively predictable**: Available since 2003. Less predictable in eligibility. Requirements have changed several times. |
| ***Flexibility*** | **Relatively flexible**: Degree of flexibility within the project once criteria are met. All changes must be justified. |
| ***Differentiation*** | **Differentiated**: Funding rates vary from **40% to 80%** depending on the firm's size and type of research. Exceptions to grant ceiling may be made for established clients of EI and other development agencies. The IPP project and follow-on activity must lead to a significant increase in the firm's employment and/or sales and exports. Early stage firms and High Potential Start Ups (HPSUs) normally **capped at €100,000**. HPSUs can receive more than €100,000 if additional funding is justifiable. |
| ***Depth*** | **Relatively deep**: Supports the creation of knowledge for firms to generate commercial advantages. |

| Policy Instrument / Intervention | Technology Gateway (Enterprise Ireland [EI]) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Relatively stringent**: Some scope for change allowed. Stringency can vary depending on the Gateway and the project. Projects can be very short-term and inexpensive or be long-term and high-value. |
| ***Level of Support*** | **Medium**: Firms use Innovation Vouchers **(€5,000)** and Innovation Partnership (**up to €200,000**) funding to engage with Technology Gateways. |
| ***Predictability*** | **Relatively predictable**: Available since 2013. Structure of €5,000-€10,000 for most projects has been consistent, where firms use innovation vouchers to engage with *Technology Gateways*. Projects connected to Innovation Partnerships are less predictable. Cost, timeframe, and nature of the project can vary on each project. |
| ***Flexibility*** | **Less flexible**: Payments are made based on clear deliverables and via a milestone-based payment system that will be aligned to each Technology Gateway's work plan. |
| ***Differentiation*** | **Low differentiated**: Available to all firms, but **mainly used by SMEs**. Gateways focuses on specific research areas, split into 3 clusters: 1) Applied Internet of Things, 2) Materials & Engineering, and 3) Food and Beverages. |
| ***Depth*** | **Deep**: Designed to affect firms across the innovation value chain and contribute to knowledge creation. |

| Policy Instrument / Intervention | Technology Centre (Enterprise Ireland [EI]) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent**: Has specific mandate to provide industry-led research agenda for firms based in Ireland. |
| ***Level of Support*** | **Medium**: All *Technology Centres* have received consistent support since their implementation. |
| ***Predictability*** | **Relatively predictable**: Little change in structure since its introduction. Some specific characteristics may vary between the different *Technology Centres*. |
| ***Flexibility*** | **Relatively flexible**: Researchers must conduct their research within the scope of the *Technology Centre's* mandate. Flexibility can change somewhat depending on the projects and the firm(s) involved. |
| ***Differentiation*** | **Less differentiation**: Available to Irish-based manufacturing and internationally traded service firms. |
| ***Depth*** | **Deep**: Supports firms to develop knowledge that may benefit firms' innovation process. |

**Table 3: Design features of innovation and science policy instruments in Ireland (2007-2020) (continued [2])**

| Policy Instrument / Intervention | Small Business Innovation Research (SBIR; Enterprise Ireland [EI]) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Firms apply for a specific project and are selected based on this application. Project must address the specific research questions outlined. Firms compete to progress from **Phase 1** (technical feasibility study) to **Phase 2** (prototype stage). |
| ***Level of Support*** | **Medium**: The exact amount each challenge is worth varies from challenge to challenge. As of 2020, active funds are between **€200,000 and €300,000**. Firms compete for this funding in a 2-stage process. *Small Business Innovation Research* (SBIR) Challenges are divided into two Phases: **Phase 1** – up to 6 firms undertake a technical feasibility study to understand the challenge and identify a potential solution to solve a public sector organisation's problem. **Phase 2** – a smaller number of firms prototype a specific project, through extensive R&D. |
| ***Predictability*** | **Relatively predictable**: Available since 2008. Some changes to structure over time have seen it become more generous. The SBIR Challenges were launched in 2019 to encourage SMEs to engage in innovation. |
| ***Flexibility*** | **Less flexible:** Firms are encouraged to be innovative and creative with their approach to the challenge. However, the topic and aims are fixed and dependent on the challenge. |
| ***Differentiation*** | **Relatively differentiated:** Funding amounts vary from challenge to challenge. Firms put forward their innovative ideas/solutions. If a firm is selected for the project, it **receives funding for the project**. Limited to the Challenge's overall fund limit and how many other firms are selected. |
| ***Depth*** | **Relatively deep**: Focuses on firms and public sector organisations collaborating with each other on innovative solutions to problems. |

| Policy Instrument / Intervention | Tailored Company Expansion Package (including R&D) (Enterprise Ireland [EI]) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Less stringent**: All manufacturing and eligible internationally traded services firms, employing ten or more people, are eligible. Firms can use the funding for a wide variety of purposes, such as: capital assets; job creation; R&D; training; management; development; and consultancy (i.e. not limited to R&D and innovation). |
| ***Level of Support*** | **Medium**: Varies on a **case-by-case basis**. Factors determining the level of support include: need for financial support for the project; anticipated growth targets; potential employment; and regional location of the firm in Ireland. There are no fixed rates for these factors. |
| ***Predictability*** | **Relatively predictable**: Eligibility criteria has remained constant. Applications are assessed on a case-by-case basis, not automatically allocated. |
| ***Flexibility*** | **Relatively flexible:** Once the basic criteria are met, firms can use this funding for many purposes. |
| ***Differentiation*** | **Differentiated**: The amount firms receive varies depending on **assessment of criteria**, including: the need for financial support for a project; anticipated growth targets; potential employment; and a firm's location in Ireland. |
| ***Depth*** | **Relatively deep**: Covers the full range of depth. Some projects may be centred on knowledge creation, while others focus on commercialisation. However, this support can also be used for non-innovation/R&D projects. |

| Policy Instrument / Intervention | Innovative High Potential Start Up (HPSU; Enterprise Ireland [EI]) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent**: Firms must meet definition of what a High Potential Start Up (HPSU) is. Business plan must be new or substantially improved compared to state-of-art in the industry. |
| ***Level of Support*** | **High**: Maximum funding rate is **50%** of required investment amount per investment round. Average funding approved is €200,000 in seed phase. Additional funding is based on achieving agreed milestones. Maximum equity funding provided by EI is **€1 million** over three years (€1.25 million for regions outside Dublin). |
| ***Predictability*** | **Relatively predictable**: Available in its current form since 2008. Structure changed in 2008 to become focused on overall business plan, rather than specific eligible expenditure in the plan (e.g. R&D, employment, training). |
| ***Flexibility*** | **Relatively flexible**: Once stringency criteria are met, there is some flexibility in terms of what the funding can be used for. However, HPSUs must meet agreed milestones for continued funding. |
| ***Differentiation*** | **Differentiated**: Available to small firms who are in existence for less than five years. The level of investment by EI depends on business plan assessment and supporting evidence, and factors including: firm's viability; firm's growth potential; the potential value to the Irish economy in number and quality of jobs created and exports generated, level of risk; quality and innovative aspects of the business plan; and achieving previous milestones/EI investment targets. Firms based in Dublin can receive €1 million over three years in EI equity funding. Firms based outside of Dublin can receive €1.25 million over three years in EI equity funding. |
| ***Depth*** | **Deep**: Supports creation of knowledge for HPSUs to use in their innovation process. |

**Table 3: Design features of innovation and science policy instruments in Ireland (2007-2020) (continued [3])**

| Policy Instrument / Intervention | European Space Agency (ESA) Project (Enterprise Ireland [EI]) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Relatively stringent**: Funding provided through winning a competitive contract bid from European Space Agency (ESA). |
| ***Level of Support*** | **High**: **€5 billion** budget per annum, but funding is competitive. Less predictable due to having to win contracts. |
| ***Predictability*** | **Relatively predictable**: Available since 1975. New opportunities are consistently available, but always on a competitive basis. |
| ***Flexibility*** | **Less flexible:** Firms that are awarded contracts must meet the requirements of the contract. |
| ***Differentiation*** | **Less differentiated**: All firms in Ireland are eligible to apply for ESA tender opportunities. However, Ireland must be participating in the ESA programmes for firms to be eligible. |
| ***Depth*** | **Relatively deep**: Research-oriented nature of the contracts necessitates knowledge creation and transfer. |

| Policy Instrument / Intervention | Enterprise Ireland Technical Feasibility Fund (Enterprise Ireland [EI]) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent**: Must complete progress report during project. |
| ***Level of Support*** | **Medium:** Supports firms for up to **50%** of eligible costs, up to **€15,000** |
| ***Predictability*** | **Relatively predictable:** Structure has remained consistent. |
| ***Flexibility*** | **Less flexible**: Must relate all actions taken to the original objectives in progress report. |
| ***Differentiation*** | **Less differentiated:** Available to all firms in Ireland. |
| ***Depth*** | **Relatively deep:** Helps firms gain an understanding of whether the project is feasible. |

| Policy Instrument / Intervention | Exploring Innovation Grants (Enterprise Ireland [EI]) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Less stringent**: Firm must qualify as a client or potential client of EI, and approval is subject to application and basic eligibility criteria. |
| ***Level of Support*** | **Low**: Maximum grant rate is **50% of eligible expenses**, up to maximum grant of **€35,000**. |
| ***Predictability*** | **Relatively predictable:** Structure has remained consistent. |
| ***Flexibility*** | **Flexible**: Firms can make changes to the approved project plan if it supports their overall innovation process and potential. |
| ***Differentiation*** | **Less differentiated**: Firms must have more than 10 employees. |
| ***Depth*** | **Relatively deep**: Aims to help firms explore and develop their innovation processes. Firms are expected to have a project plan stemming from their research with the *Exploring Innovation Grant*, which leads to applying for further EI funding to develop innovation processes further. |

| Policy Instrument / Intervention | Agile Innovation Fund (Enterprise Ireland [EI]) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Relatively stringent**: Project activities must remain consistent with and directed towards approved objectives, and align with project costs. Small changes are acceptable as project develops. |
| ***Level of Support*** | **High**: Provides **50% grant support** for projects costing up to **€300,000**. Maximum grant is **€150,000**. |
| ***Predictability*** | **Predictable:** Available since 2017. |
| ***Flexibility*** | **Less flexible**: All changes must be approved by an EI *R&D Committee*. If project objectives change (unless minor), it is recommended to cancel the project and start a new application as funding costs could change. |
| ***Differentiation*** | **Differentiated**: Grant rates vary from 25% to 50%. Dependent on firm size, project type, and collaboration. ***Agile Innovation:*** Max grant rate – Small firms 45%, Medium firms 35%, and Large firms 25%. ***R&D and Agile with Collaboration****:* Maximum grant rate – Small firms 50%, Medium firms 50%, Large firms 40%. ***Business Innovation:*** Max grant rate – Small firms 50%, Medium firms 50%, Large firms are *not eligible*. |
| ***Depth*** | **Relatively deep**: Aimed at firms undergoing small/short term projects. However, some firms may make use of funding to bring potentially industry-leading research to the market quickly. |

**Table 3: Design features of innovation and science policy instruments in Ireland (2007-2020) (continued [4])**

| Policy Instrument / Intervention | Intellectual Property Assistance (IP) Scheme (Enterprise Ireland [EI]) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Relatively stringent:** Has strict eligibility criteria and rules must be complied with. |
| ***Level of Support*** | **Low:** HEI Patent covers **100% of eligible costs**. *Industry Patent* grant support is generally capped at **€20,000**. Exceptions can be made on a case-by-case basis. |
| ***Predictability*** | **Predictable:** Available since 1998. Introduced the *Higher Education Institution* (HEI) Patent in 2004. Scheme was phased out in 2009. The patent funding supports provided to firms under the Industry Patent Fund have been integrated into Enterprise Ireland's R&D Fund and other relevant initiatives. |
| ***Flexibility*** | **Relatively flexible:** Must comply with rules throughout process. However, maximum funding limit can be increased in exceptional circumstances. Assessed on case-by-case basis. |
| ***Differentiation*** | **Differentiated:** Offers two different supports. One supports HEIs, and the other supports Industry. The **HEI Patent** usually covers 100% of the eligible costs. Costs differ depending on which stage of the application it is in. Stage 1 (Provisional Patent Filing) offers support up to €7,000. Stage 2 (Full Patent Filing) offer support up to €20,000. Stage 3 (Full 'national filing' in different countries) offers support up to €50,000. The **Industry Patent** offers firms grants typically up to €20,000. Costs differ depending on the stage the application is in. In Stage 1, advice is offered. In Stage 2, funding for patent submission is offered. In Stage 3, funding up to a limit of €20,000 is offered. Can offer higher grants on a case-by-case basis. |
| ***Depth*** | **Relatively deep:** Supports HEIs and firms in protecting their Intellectual Property. |

| Policy Instrument / Intervention | IDA R&D & Innovation Grant Aid (IDA Ireland) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent**: IDA appoint an external Technical Assessor to assess whether the R&D funding is necessary/eligible for the project. |
| ***Level of Support*** | **High**: Consider projects in three different categories: **up to €500,000**, between **€500,000 and €7.5 million**, and **greater than €7.5 million**. |
| ***Predictability*** | **Predictable**: Available since 2000. Evolved from IDA Capability Grant. Structure has remained predictable. |
| ***Flexibility*** | **Relatively flexible**: Once necessary requirements are met, firms are able to use grant for a variety of activities within the bounds of establishing major new R&D facilities, expanding existing R&D facilities, and in developing R&D projects. However, firms have strict agreements in place from the approved proposal. Approved projects must be completed by an agreed deadline, but extensions to this deadline can be granted. |
| ***Differentiation*** | **Relatively differentiated**: Available to all foreign-owned firms based in Ireland. If firms in different countries collaborate, only the eligible R&D costs of the Irish-based activity will be supported under this programme. |
| ***Depth*** | **Relatively deep**: Supports foreign-owned firms based in Ireland develop all stages of their innovation processes. |

| Policy Instrument / Intervention | IDA R&D Feasibility Grant (IDA Ireland) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** All *IDA Ireland R&D grants*, which include feasibility studies, are subject to terms and conditions. |
| ***Level of Support*** | **High:** Offers support worth **up to €250,000**. |
| ***Predictability*** | **Relatively predictable:** Structure has remained consistent. |
| ***Flexibility*** | **Relatively flexible:** Feasibility grants are offered under the General Block Exemption Regulation, which dictates that the funded project must be completed as outlined in the approved plan. IDA Ireland can accommodate non-material changes, but the project outcome must be as originally agreed. |
| ***Differentiation*** | **Less differentiated:** Available to all firms who meet the requirements. |
| ***Depth*** | **Deep:** *Feasibility Grants* support firm-level R&D and innovation projects that span the full range of knowledge creation and knowledge transformation activities (i.e. from experimental development to basic research). |

**Table 3: Design features of innovation and science policy instruments in Ireland (2007-2020) (continued [5])**

| Policy Instrument / Intervention | SFI Centres for Science, Engineering, and Technology (CSETs; Science Foundation Ireland) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent**: Firms are expected to share 20% of research project costs arising from the collaboration. |
| ***Level of Support*** | **High**: Each CSET has an annual budget of **€3 million**. CSETs receive this funding and use it collaborate with firms, who invest their own money into the collaboration. |
| ***Predictability*** | **Predictable**: Available since 2003. Amalgamated with other SFI policy instruments to form new *SFI Research Centres* programme in 2012. |
| ***Flexibility*** | **Less flexible**: Must meet stringency requirements for continued funding, including conducting world-leading basic and applied research and collaboration with firms. |
| ***Differentiation*** | **Less differentiated**: All firms are eligible to collaborate with CSETs. However, it is usually a pre-requisite for a firm to be (at a minimum) R&D active, as collaborations focus on research (as opposed to development). |
| ***Depth*** | **Deep**: Focus on creating new knowledge. Facilitates collaboration between researchers and firms. |

| Policy Instrument / Intervention | SFI Strategic Research Clusters (SRCs; Science Foundation Ireland) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Relatively stringent**: Initially industry involvement was not required, though most SRCs did have industry partners from the beginning. Industry involvement could be either 'in cash' or 'in kind'. |
| ***Level of Support*** | **High**: In 2007, the SRCs were launched with an initial €74.9 million grant. This funding gradually decreased *per annum* as the SRCs evolved into the *SFI Research Centres* programme in 2012. |
| ***Predictability*** | **Predictable**: Amalgamated with other SFI policy instruments in 2012 to form new *SFI Research Centres*. |
| ***Flexibility*** | **Relatively flexible**: Progress updates every six months are required. Changes are allowed, if they can be justified and explained. |
| ***Differentiation*** | **Less differentiated**: All firms are eligible to collaborate with SRCs. |
| ***Depth*** | **Deep**: Focus on creating knowledge. Particularly with regards to knowledge that can be commercialised. |

| Policy Instrument / Intervention | SFI Research Centres (Science Foundation Ireland) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent**: Firms collaborate with the research centres and must complete progress reports throughout the project to maintain funding. Firms must make a minimum 30% financial contribution and a verifiable intellectual contribution to all research collaborations. |
| ***Level of Support*** | **High**: All research centres given consistent support, receiving between **€1 - 5 million** per year in direct funding. |
| ***Predictability*** | **Predictable**: Available since 2012. This is an amalgamation of previous SFI policy instruments. |
| ***Flexibility*** | **Relatively flexible**: Changes or deviations are allowed if explained or justified over the course of the project. |
| ***Differentiation*** | **Less differentiated**: Available to all firms. |
| ***Depth*** | **Deep**: Aim to create knowledge. |

| Policy Instrument / Intervention | R&D Tax Credits (Irish Revenue Commissioners) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent**: Has a strict definition of what R&D qualifies for tax credit. |
| ***Level of Support*** | **High**: 25% tax credit applies to all relevant R&D expenditure. |
| ***Predictability*** | **Predictable**: Available since 2004. Less predictable in structure. Consistent changes made in most years since introduction. Evolved gradually from an incremental-based system to a volume-based system. However, all changes have made the *R&D tax credit* more generous and facilitated more claims. |
| ***Flexibility*** | **Relatively flexible**: Once minimum standard/definition of R&D is met, firms can claim for any eligible costs. |
| ***Differentiation*** | **Less differentiated**: Available to all firms. |
| ***Depth*** | **Covers the full range of depth**: Firms can claim the *R&D tax credit* for any eligible R&D expenditure, from knowledge creation to commercialisation. |

**Sources of information used in compiling Table 3: Department of Business, Enterprise, and Innovation (2018a; 2018b; 2019), Department of Finance (2013; 2016), Enterprise Ireland (2015; 2019a; 2019b; 2020a; 2020b; 2020c; 2020d; 2020e; 2020f; 2020g; 2020h; 2020i; 2020j; 2020k; 2020l; 2020m; 2020n; 2020o; 2020p; 2020q), Forfas (2013), IDA Ireland (2019; 2020a; 2020b; 2020c; 2020d), Irish Revenue Commissioners (2020a; 2020b), Myriad Associates (2019), OECD STIP Compass (2020a), Science Foundation Ireland (2009; 2020a; 2020b).**

## Section 3.2 United Kingdom

There are many funding agencies/government bodies responsible for innovation and science policy instruments in the United Kingdom (UK) at the firm level. These include:

1. UK Research and Innovation (UKRI)

*UK Research and Innovation* (UKRI) works in partnership with universities, research organisations, firms, charities, and government, with the goal of creating the best possible environment for research and innovation to flourish (UKRI, 2020a). Operating across the whole of the UK with a combined annual budget of more than £7 billion (UKRI, 2020a), UKRI brings together the seven Research Councils, Innovate UK, and Research England (UKRI, 2020b). UKRI aims to maximise the contribution of each of component parts, working individually and collectively (STFC, 2020). Through this structure, UKRI works with the many partners noted above to benefit UK citizens through developing and harnessing knowledge, talent, and ideas (EPSRC, 2020). UKRI's mission is to be a trusted partner and to ensure research and innovation continues to flourish in the UK (UKRI, 2018). The UKRI aims to support and also to help connect the best researchers and innovators with customers, users, and the public. UKRI's stated goal is to invest every pound of taxpayers' money wisely, in a way that maximises impact for citizens, in the UK and across the world (UKRI, 2018).

2. Innovate UK

*Innovate UK*, part of UK Research and Innovation, is a non-departmental public body funded by a grant-in-aid from the UK government. The Technology Strategy Board (TSB) was established in 2004 within the Department of Trade and Industry (DTI). TSB became an independent body in July 2007 after the reorganisation of the DTI into the Department for Innovation, Universities and Skills (DIUS) and the Department for Business, Enterprise, and Regulatory Reform (BERR) (Innovate UK, 2017a). In August 2014, the organisation adopted the name *Innovate UK* (Innovate UK, 2017a). Innovate UK aims to drive productivity and economic growth by supporting firms to develop and realise the potential of new ideas, including those from the UK's research base (Innovate UK, 2020a). To support innovation, *Innovate UK* offers grants to firms and other organisations. Since 2007, *Innovate UK* has invested approximately £1.5 billion to help firms across the UK to innovate, with match-funding from industry taking the total value of projects above £3 billion (Innovate UK, 2020a). *Innovate UK* has supported 5,000 innovative firms to create approximately 35,000 jobs and added an estimated £7.5 billion of value to the UK economy[3]. *Innovate UK* offers programmes and schemes to help firms carrying out Research and Development (R&D) and innovation.

3. Research Councils

Within UKRI, there are seven Research Councils (UKRI, 2020b). These councils each focus on specific areas and disciplines, and are responsible for funding and coordinating academic research for the arts, humanities, science, and engineering (UKRI, 2020c). The seven Research Councils are as follows: 1) Arts and Humanities Research Council (AHRC), which funds

[3] For further information on Innovation UK's innovation and science policy instruments, see https://www.gov.uk/government/organisations/innovate-uk/about

outstanding original research across the whole range of the arts and humanities; 2) Biotechnology and Biological Sciences Research Council (BBSRC), which invests to push back the frontiers of biology and deliver a healthy, prosperous and sustainable future; 3) Economic and Social Research Council (ESRC), which is the UK's largest funder of economic, social, behavioural and human data science; 4) Engineering and Physical Sciences Research Council (EPSRC), which creates knowledge in engineering and physical sciences for UK capability to benefit society and the economy; 5) Medical Research Council (MRC), which funds research at the forefront of science to prevent illness, develop therapies and improve human health; 6) Natural Environment Research Council (NERC) which is the driving force of investment in environmental science; and 7) Science and Technology Facilities Council (STFC), which supports research in astronomy, physics, space science and operates world-class research facilities for the UK. The *Research Councils* can collaborate with firms to carry out joint research. The MRC and ESPRC accounted for over half of the total amount invested in the Research Councils between 2004 and 2016 (Vanino et al., 2019).

4. Her Majesty's Revenue and Customs (HMRC)

*Her Majesty's Revenue and Customs* (HMRC) is the UK's tax, payments, and customs authority. HMRC's primary responsibility is for collecting the revenues that fund for the UK's public services and social supports (HMRC, 2020a). HMRC is also responsible for implementing the UK's R&D tax credit scheme (HMRC, 2020a). Within an overall R&D tax credit programme, HMRC has distinct schemes providing targeted support for SMEs and larger firms within the UK (HMRC, 2017).

5. Scottish Enterprise (SE)

*Scottish Enterprise* (SE) is a sponsored non-departmental public body of the Scottish Government which encourages economic development, enterprise, innovation, and investment in firms (Small Business, 2018). SE covers the eastern, central, and southern parts of Scotland. A separate agency of the Scottish Government, Highlands and Islands Enterprise operates in north-western Scotland and works closely with SE (Scottish Enterprise, 2020a). The aims of SE include growing the Scottish economy, fostering employment creation (with an emphasis on high-quality jobs) and regional development (Scottish Enterprise, 2020b). To achieve this, SE implements a range of policy interventions/instruments to support firm-level innovation (Scottish Enterprise, 2020c).

6. Interface:

Established in 2005, with support from the Scottish Funding Council (SFC), Scottish Enterprise (SE) and Highlands and Islands Enterprise (HIE), *Interface* is a hub connecting a wide variety of firms and industries to Scotland's 23 higher education and research institutes (Scottish Funding Council, 2020). *Interface* aims to promote firm-academic collaborations through translating the needs of firms into manageable projects for Scottish universities and research institutions (Interface, 2020). A key service *Interface* provides is running the Innovation Vouchers programme in Scotland on behalf of the SFC (UHI, 2020).

**Table 4: Innovation and science policy instruments available to firms in the UK (2007-2020)**

| Policy Instrument / Intervention | Industrial Strategy Challenge Fund (ISCF) Challenges (First introduced in 2016 – 2017) |
|---|---|
| ***Agency responsible*** | Innovate UK |
| ***Criteria / Eligibility Requirements*** | Available to all firms based in the UK. Supports all stage of innovation process, from basic research to commercialisation of output. Eligibility may change for specific *Challenges*. Multiple Challenges available for different topics/areas of expertise. Applications are assessed by up to five independent assessors. Collaboration between firms and research institutes may be required depending on the stage of the project. Exact level of funding is specific to the *Challenge*. Firms compete for funding for each *Challenge*. Each *Challenge* has a **dedicated fund ranging from £20 million up to £246 million**. |
| ***What is the support for*** | A fund to strengthen UK science and business innovation and take on the **biggest challenges that society and industry face**. Aims to bring together world-leading research with the UK's best firms. |
| ***Funding and Scale*** | Approximately £5.6 billion has been in invested in projects during the period 2016 – 2020. This is made up of approximately £2.6 billion of public money and £3 billion in matched funding from the private sector. |

| Policy Instrument / Intervention | Innovate UK Smart Grants (First introduced in 2019; Previously known as 'Open grant funding' programme) |
|---|---|
| ***Agency responsible*** | Innovate UK |
| ***Criteria / Eligibility Requirements*** | Available to all firms registered in the UK in any industry or technology area, conducting projects in the UK. Larger firms must work in a group or consortium. In a consortium, the group of applicants must include at least one micro firm (less than 10 employees and less than €2 million turnover or balance sheet total) or SME (less than 50 employees and less than €10 million turnover or balance sheet total). SMEs can apply to work independently. To be eligible, firms need the following: an idea for a completely new product/service/process, or a brand-new use or an unprecedented use for an existing product/service/process. Different amounts of grant funding are available depending on the size of the firm applying for funding and the stage of their project. Consortiums can contain research organisations as well as firms, and the research organisations in consortium can share up to 30% of the total eligible project costs. If the consortium contains more than one research organisation, this maximum is shared between them. For **feasibility studies and industrial research projects**, eligible projects are funded as follows: Micro firms or Small firms– up to 70%, Medium-sized– up to 60%, and Large firms– up to 50%. For **experimental development projects** which are nearer to market, eligible projects are funded as follows: Micro or Small firms – up to 45%, Medium – up to 35%, and Large firms – up to 25%. Duration between 6 and 18 months and total eligible project costs between **£25,000 and £500,000**. Projects with duration between 19 and 36 months and eligible project costs between **£25,000 and £2 million** must be collaborative. Projects with eligible costs **over £2 million** (but not exceeding £3 million) may be considered on a case-by-case basis. |
| ***What is the support for?*** | Available for **game-changing and disruptive ideas** from firms, through a regular, competitive application process. Grants are for projects that can provide evidence for considerable potential to gain market share, generate economic impact and exports. |
| ***Funding and Scale*** | £90.9 million, 508 grants in 2019 |

| Policy Instrument / Intervention | Innovation Voucher (First introduced in 2012) |
|---|---|
| ***Agency responsible*** | Innovate UK |
| ***Criteria / Eligibility Requirements*** | Available to all micro-firms, and SMEs. Firms must require assistance with a problem representing a significant challenge for the firm (e.g. new product development). The firm cannot have previously worked with their proposed partner and can only receive one voucher. Vouchers are awarded via random allocation among firms that apply and meet the eligibility criteria. Each voucher is worth a **maximum of £5,000** and must be used within 6 months of approval. |
| ***What is the support for*** | Encourages firms to **seek out fresh knowledge** that can help the firm to grow and develop. Can include advice on an innovative idea. |
| ***Funding and Scale*** | Supplied £1.14 million in round 2 of vouchers for 217 projects (2012 – 2013). Supported 2,500 firms (2012 – 2015). |

**Table 4: Innovation and science policy instruments available to firms in the UK (2007-2020) (continued [1])**

| Policy Instrument / Intervention | Knowledge Transfer Partnership (First introduced in 1975; Previously the Teaching Companies Scheme [TCS]) |
|---|---|
| ***Agency responsible*** | Innovate UK |
| ***Criteria / Eligibility Requirements*** | Available to UK-based firms of any size (SMEs sometimes prioritised) and not-for-profit organisations. The project must be a three-way partnership between: 1) firm or not-for-profit organisation; 2) an academic, research organisation or Catapult (a university, college or research and technology organisation in the UK); and 3) a suitably-qualified graduate, with the capability to lead a strategic project. The *Knowledge Transfer Partnership* (KTP) is part-funded by a grant. **£77,338 is the average sized grant** for a completed project. |
| ***What is the support for?*** | Aims to help UK firms to improve their competitiveness and productivity through the **better use of knowledge, technology and skills** that reside within the UK Knowledge Base (i.e. higher education institutions, colleges, or research organisations). Bring new knowledge and expertise into firms. |
| ***Funding and Scale*** | £520.5 million, 5,559 firms (1982 – 2014) |

| Policy Instrument / Intervention | Knowledge Transfer Network (KTN; The single KTN programme launched in 2014; There had been several sector KTN programmes dating back to 2004) |
|---|---|
| ***Agency responsible*** | Innovate UK |
| ***Criteria / Eligibility Requirements*** | Available to all firms based in the UK. *Knowledge Transfer Network* (KTN) is a series of networks that helps link firms together. KTN is a network partner of Innovate UK. Funding is given to KTN to help bring together firms, academics, government agencies and research organisations. The KTN helps manage funding opportunities such as the Industrial Strategy Challenge Fund. KTN implements five cross-cutting business programmes labelled as follows: 1) Design, 2) Access to Funding and Finance, 3) High Value Manufacturing, 4) Horizon 2020, and 5) International. The KNT programme holds various events throughout the year (**421 events** in 2018/19) to help firms participate in funding opportunities from other organisations or find the right opportunity for the firm. |
| ***What is the support for*** | Bringing together firms, academics, government agencies and research organisations to **facilitate knowledge transfer** and to build better links between science, creativity, and business. The network's main objectives are to increase firm-led R&D in the UK, increase collaboration between firms (referred to as B2B) and between firms and the research base (referred to as B2R), and facilitate the exploitation of R&D to help the UK capture more value from innovation. |
| ***Funding and Scale*** | £15 million, 15 KTNs (2011 – 2012) |

| Policy Instrument / Intervention | Small Business Research Initiative (SBRI; First introduced in 2004) |
|---|---|
| ***Agency responsible*** | Innovate UK |
| ***Criteria / Eligibility Requirements*** | Available to firms and public sector organisations of any size. Funds **100%** of the cost of a feasibility study for a particular technology in Phase 1 of the programme, and the cost of developing a prototype in Phase 2 of the programme. Phase 1 contracts are normally between **£50,000 and £100,000** and the competition takes 6 months for the feasibility study to be conducted by the firms. Phase 2 may last up to two years. The amount that can be allocated to individual firms within the Phase 2 competition is between **£250,000 and £1 million**. However, there are no strict limits to funding allocation. |
| ***What is the support for*** | Connects government organisations with innovative firms to **solve major challenges facing society**. |
| ***Funding and scale*** | £430 million, 2,900 SBRI contracts (2009 – 2017) |

| Policy Instrument / Intervention | Investment Accelerator pilot (First introduced in 2017) |
|---|---|
| ***Agency responsible*** | Innovate UK |
| ***Criteria / Eligibility Requirements*** | Available to SMEs looking for early stage grant funding and who wish to establish an equity relationship with a UK venture capital firm. Project are expected to cost **up to £150,000**, where **100%** of project costs are covered. Innovate UK provides up to 70% of eligible project costs in grant funding for micro or small firms, and up to 60% if for medium-sized firms. Innovate UK's investor partners match fund the remaining 30% or 40% of project costs through equity investment or convertible loans. |
| ***What is the support for*** | Provides simultaneous grant funding and venture capital investment for **early stage projects** led by UK SMEs. Enables management teams to focus on business activities, rather than continually trying to secure investment. |
| ***Funding and scale*** | £13.5 million, 98 projects (2017 – 2021) |

**Table 4: Innovation and science policy instruments available to firms in the UK (2007-2020) (continued [2])**

| Policy Instrument / Intervention | Innovation Loans (First introduced in 2017 as a three-year pilot programme) |
|---|---|
| ***Agency responsible*** | Innovate UK Loans Ltd (a wholly owned subsidiary of Innovate UK) |
| ***Criteria / Eligibility Requirements*** | Available only to SMEs. Targeted at **near to market innovations**. Firms use *Innovation Loans* to finance late-stage R&D projects, categorised as experimental development. Firms can borrow between **£100,000 and £1 million**, to cover up to 100% of eligible project costs. |
| ***What is the support for*** | Loans offered through competitions to UK SMEs that want to scale up and grow by **developing new or improved** products, processes, or services. As a pilot, *Innovation Loans* also aims to provide lessons on how a national rollout could be optimally implemented. |
| ***Funding and scale*** | £50 million, 5 competitions (2017 – 2020) |

| Policy Instrument / Intervention | Innovation to Commercialisation of University Research (ICURe; First introduced in 2014) |
|---|---|
| ***Agency responsible*** | Innovate UK |
| ***Criteria / Eligibility Requirements*** | Available to any research team based in any UK universities and across all disciplines. Funds research teams to accelerate the time it takes to get ideas from the lab to commercialisation. Aims to see research teams start spin-off firms stemming from their research. Initially, firms received funding for the salary and travel costs of the participating teams, who received grants of up to **£50,000**. However, upon implementation of the programme, this allocation was deemed too high and a new budget of **£35,000** was set, providing up to **£15,000** in salaries and **£20,000** in travel expenses to teams |
| ***What is the support for?*** | Aims to tackle several barriers to the commercialisation of university research, through the delivery of a programme of commercialisation support for teams of academic researchers wishing to explore the **commercial potential of research** originating in universities. |
| ***Funding and scale*** | £21.4 million, 81 projects (2015/16 – 2020/21) |

| Policy Instrument / Intervention | The Catapult Network (First introduced in 2011) |
|---|---|
| ***Agency responsible*** | Innovate UK |
| ***Criteria / Eligibility Requirements*** | Available to all firms. The *Catapult Network* is made up of a variety of *Catapult Centres*. *Catapult Centres* are not-for-profit, independent physical centres which **connect firms** with the UK's **research and academic communities**. Each respective *Catapult Centres* is funded by Innovate UK, then firms collaborate with the Centres on research projects in the following areas: High Value Manufacturing, Cell Therapy, Offshore Renewable Energy, Satellite Applications, Connected Digital Economy, Future Cities and Transport Systems. |
| ***What is the support for*** | The *Catapults* are a nationwide network of technology centres, created by Innovate UK, designed to **harness UK innovation** and boost productivity. |
| ***Funding and scale*** | £1.25 billion (circa £745 million from the public sector), 10 Centres for the financial years 2014 – 2017. |

| Policy Instrument / Intervention | Medical Research Council (First introduced in 1913) |
|---|---|
| ***Agency responsible*** | Research Councils (UK Research and Innovation) |
| ***Criteria / Eligibility Requirements*** | All firms in the UK are eligible to collaborate. Offers a series of supports for firms to collaborate with academia (with support from *Innovate UK*). A key support offered by MTC is *Biomedical Catalyst*, which offers four types of competitions for SMEs: Feasibility Award, Primer Award, Early-Stage Award, and Late-Stage Award. Amounts can vary from to year-to-year, and competition-to-competition. In 2019, **Round 1 Feasibility and Primer** awards saw firms compete for a share of **£3 million**. Academic-led applications for Early- and Late-Stage awards are primarily administered through the *Developmental Pathway Funding Scheme* (DPFS). There is no formal limit to the total amount that can be requested in a DPFS grant. However, MRC specify that all costs should be fully justified within a proposal and an appointed panel will assess value for money. |
| ***What is the support for*** | Focuses on **high-impact research** and has provided the financial support and scientific expertise behind a number of medical breakthroughs. |
| ***Funding and scale*** | £7.19 billion, 7,250 projects (2012 – 2018). |

**Table 4: Innovation and science policy instruments available to firms in the UK (2007-2020) (continued [3])**

| Policy Instrument / Intervention | Engineering and Physical Sciences Research Council (EPSRC) (First introduced in 1994) |
|---|---|
| ***Agency responsible*** | Research Councils (UK Research and Innovation) |
| ***Criteria / Eligibility Requirements*** | All firms in the UK are eligible to collaborate. Individual *Engineering and Physical Sciences Research Council* (EPSRC) research projects are university-led, often involving firms as collaborators, and are selected for funding on a competitive basis. EPSRC funding is provided only to university partners, with partner firms either making financial or in-kind contributions (e.g. equipment use or staff time) to a project. Exact level of support varies depending on the total number and value of proposals submitted to EPSRC. **The average level of funding** in 2018 was **£875,000**. Research impact is now a core consideration throughout the grant application process. EPSRC specify that showing how the applicant(s) will maximise the impact of the proposed research should be intrinsic to the proposal itself in a way that is appropriate to the nature and scope of the research being proposed. |
| ***What is the support for?*** | Provides funding for national research through a wide range of grants. Support **allows universities and firms to collaborate** on projects. |
| ***Funding and Scale*** | £1.97 billion, 5,675 projects (2004 – 2016) |

| Policy Instrument / Intervention | Research and Development Tax Relief (First introduced in 2000) |
|---|---|
| ***Agency responsible*** | Her Majesty's Revenue and Customs (HMRC) |
| ***Criteria / Eligibility Requirements*** | Available to all firms. There are two different schemes. The **R&D relief for small or medium-sized enterprises (SMEs) is only available for profit-making** SMEs (less than 500 staff and a turnover of under €100 million or a balance sheet total under €86 million). The *Research and Development Expenditure Credit* (RDEC) is intended for larger firms (more than 500 staff and a turnover of over €100 million and a balance sheet total over €86 million). The rates are **typically 25%** of for profit-making SMEs and **13%** of eligible costs for large firms. At its inception in 2000, tax relief was only available to SMEs. Extended to large firms (more than 500 staff a turnover of over €100 million or a balance sheet total over €86 million) in 2002-03, and for vaccine research in 2003-04. In 2015, the relief available to SMEs increased to a net figure of 230% on qualifying R&D costs from yearly profit. For example, if an SME spends £100,000 on R&D, £130,000 can be deducted from the SMEs profits, with Corporation Tax only charged on the revised profit. Loss-making firms can surrender their losses in return for a payable tax credit in certain circumstances. The rates of enhanced deductions for both large firms and SMEs were increased. The RDEC was introduced in 2013. |
| ***What is the support for?*** | To encourage scientific and technological innovation within the UK. Aims to **encourage greater R&D spending**, leading in turn to greater investment in innovation. Objective of the recent changes to the SME scheme is to provide further incentives for SMEs and start-ups to invest in R&D. |
| ***Funding and Scale*** | £9.5 billion, 35,500 firms (2001 – 2013) |

| Policy Instrument / Intervention | Enterprise Investment Scheme (EIS; First introduced in 1993, implemented in 1994; Replaced the Business Expansion Scheme) |
|---|---|
| ***Agency responsible*** | Her Majesty's Revenue and Customs (HMRC) |
| ***Criteria / Eligibility Requirements*** | Available to UK firms that meet the following criteria: less than £15 million in gross assets, less than 250 employees, been more than seven years since its first commercial sale, permanent establishment in the UK. These limits can be broadened if the firm **carries out research, development, or innovation**. Can raise up to **£5 million** each year, and a maximum of **£12 million** in the firm's lifetime. This also includes amounts received from other venture capital schemes. |
| ***What is the support for?*** | Designed so that firms can raise money to **achieve growth**. Offers tax reliefs to individual investors who buy new shares in eligible firms. |
| ***Funding and scale*** | £22 billion, 31,365 firms (1994 – 2019) |

**Table 4: Innovation and science policy instruments available to firms in the UK (2007-2020) (continued [4])**

| Policy Instrument / Intervention | Scottish Enterprise R&D Grant (First introduced in 1972) |
|---|---|
| ***Agency responsible*** | Scottish Enterprise (SE) |
| ***Criteria / Eligibility Requirements*** | Available to firms in all sectors based in or planning to locate in Scotland. Funded projects must demonstrably represent a significant innovation for the firm, with significant commercial prospects. The firm must show that the project cannot go ahead without the R&D grant or would proceed in slower timescale or significantly reduced scope, which would have detrimental impact on the commercial opportunity. Both the project and the firm must be financially viable. SMEs working independently on innovative projects may be awarded between **35% - 50%** of eligible projects costs. For SMEs carrying out R&D which will result in a product for a commercial partner(s), commercial partner(s) must **contribute a minimum 20%** to the project costs. SE then supports up to 45% of the remaining eligible project costs. Large firms working independently on innovative projects may be awarded between **25% - 40%** of eligible projects costs. Consortiums (2 – 6 firms) are also eligible. Funding rates for SMEs and large firms apply to consortiums. |
| ***What is the support for?*** | Supports **R&D** and the introduction of new or significantly improved product, process, or service **innovations**. |
| ***Funding and scale*** | £177.5 million, 341 firms (Financial years 2014 – 2019) |

| Policy Instrument / Intervention | SMART: Scotland (First introduced in 1999 as SMART; relaunched in 2007) |
|---|---|
| ***Agency responsible*** | Scottish Enterprise (SE) |
| ***Criteria / Eligibility Requirements*** | Available to SMEs based in Scotland. *SMART: Scotland* covers two key areas of R&D: conducting feasibility tests and developing prototypes. *SMART: Scotland* supports activities that have a commercial endpoint. **Feasibility:** Supports up to 70% of the eligible costs for small firms and up to 60% of the eligible costs for medium firms. Studies must last between 6 and 18 months, and the maximum grant is **£100,000**. Feasibility is paid with a third of the grant in an upfront instalment, and the rest is paid quarterly in arrears. **Prototype development:** Project aims to develop a pre-production prototype of a new product or process. SE offers up to 35% of the eligible project costs. Only supports projects with a total minimum cost of **£75,000** and the maximum amount of grant support offered is **£600,000**. Projects must last between 6 and 36 months. The grant is paid quarterly in arrears. Must provide evidence to support claim before firm can receive grant payments. |
| ***What is the support for?*** | Aims to support high-risk, highly ambitious projects. Supports **feasibility studies** that help to show how an idea could work in the real world, and the **development of prototypes** to test an idea before it goes into production. |
| ***Funding and scale*** | £38.5 million, 303 firms (Financial years 2014 – 2019) |

| Policy Instrument / Intervention | Regional Selective Assistance (RSA) funding (First introduced in 1972) |
|---|---|
| ***Agency responsible*** | Scottish Enterprise (SE) |
| ***Criteria / Eligibility Requirements*** | Available to all firms based in Scotland. Over 90% of grant offers are made to SMEs. Most offers are between **£100,000 and £250,000**, but smaller or larger grants are available. The funding is allocated to new projects that would not go ahead without public support. The project must be financially viable, make commercial sense and contribute to Scotland's economy. Grant money is likely to be paid out in arrears and in instalments. Firms can be funded for a variety of projects including the **development of new laboratory facilities**. The maximum rate a firm can receive is dependent on the size and location of the firm. These factors are assessed before the grant is awarded. The factors provide details that indicate what type of grants firms can expect. Tiers are determined by firm location. **Tier 1:** Applies to firms located in the Highlands and Islands. Highlands and Islands Enterprise is responsible for this tier. No firm has successfully applied for the funding during 2016 – 2019. **Tier 2:** Large firms may receive a grant up to a maximum of 10% of their project costs. Medium sized firms may receive up to 20% of project costs. Small firms can receive a maximum of 30% of their project costs. **Tier 3:** Only SMEs can receive RSA grants. Medium sized firms may receive a grant up to a maximum of 10% of their project costs. Small firms can receive grants up to 20% of the costs of the project. |
| ***What is the support for?*** | A discretionary grant aimed at helping projects that create or protect jobs in Scotland. Gives Scottish firms another potential source of funding for investment, alongside other UK funding mechanisms. |
| ***Funding and scale*** | £337 million, 960 projects (2009 – 2019) |

**Table 4: Innovation and science policy instruments available to firms in the UK (2007-2020) (continued [5])**

| Policy Instrument / Intervention | Standard Innovation Voucher (First introduced in 2008) |
|---|---|
| ***Agency responsible*** | Interface |
| ***Criteria / Eligibility Requirements*** | Available to all SMEs, social enterprises and third sector organisations in Scotland. The scheme aims to fund projects with a value of **up to £5,000** which drive innovation, leading to new products, services, or processes. Targeted at innovations which benefit the firm, university, research institution or further education college and the Scottish economy, such as securing or creating jobs, or allowing the firm to expand into new markets. There are two types of *Standard Innovation Voucher*: **Product/Process/Service Innovation Voucher** – to support outward innovation to develop a new product, process, or service; **Workforce Innovation Voucher** – to support inward innovation to develop the firm's internal workforce such as new or enhanced workplace processes, innovative workplace practices and innovative business expertise. |
| ***What is the support for?*** | Encourages new **first-time partnerships** between a firm and a university or further education college. |
| ***Funding and Scale*** | £7.585 million, 1,500 vouchers (2008 – 2020) |

| Policy Instrument / Intervention | Student Placement Innovation Vouchers (First introduced since 2014) |
|---|---|
| ***Agency responsible*** | Interface |
| ***Criteria / Eligibility Requirements*** | Available only to SMEs that have had a successful *Standard Innovation Voucher*. Worth between **£1,000 and £5,000**. The firm should identify a clearly defined issue or opportunity that will benefit from PhD/Masters student interaction within the firm to set timescales. The onus is on the firm/academic supervisor to have a student in place prior to submission of the application. The student and academic supervisor will be from the same institution as the standard Innovation Voucher project to allow continuity. |
| ***What is the support for*** | Aims to **building on existing relationships** between SMEs and HEIs in Scotland to continue the development of a *Standard Innovation Voucher* award. |
| ***Funding and Scale*** | £79,282, 17 firms (2014 – 2020) |

| Policy Instrument / Intervention | Advanced Innovation Vouchers (First introduced in 2011) |
|---|---|
| ***Agency responsible*** | Interface |
| ***Criteria / Eligibility Requirements*** | Available to SMEs in Scotland. Project costs should be **between £10,000 and £40,000**. SMEs can receive grants of 50% of total costs. SMEs are expected to **cover the remaining project costs**. For projects costing between £10,000 and £20,000, SMEs are expected to contribute 25% in-kind and 25% in-cash. For projects costing between £20,001 and £40,000, SMEs are expected to contribute 15% in-kind and 35% in-cash. Projects must clearly show innovation (i.e. demonstrating novel/pioneering ideas) and that the project will lead to new, or significantly enhanced, products, services, or processes to benefit the firm, academic institution and Scottish economy. Projects must require the expertise of an academic partner and cannot be delivered commercially. |
| ***What is the support for*** | **Building sustained relationships** between SMEs and Higher Education Institutions (HEIs) in Scotland who have collaborated previously or for SMEs who seek a collaborative HEI partner. |
| ***Funding and Scale*** | £1.2 million, 90 firms (2011 – 2020) |

**Sources of information used in compiling Table 4: Catapult (2020), Chapman & Hewitt-Dundas (2018), European Commission (2020a), Ernst & Young (2017), Fowkes et al. (2015), Her Majesty's Revenue and Commission (2016, 2017, 2019, 2020a, 2020b), Innovate UK (2015, 2017a, 2017b, 2017c; 2018; 2019a; 2019b; 2019c; 2019d; 2020a; 2020b; 2020c; 2020e), Interface (2020), Ipos MORI (2018), Knowledge Transfer Network (2020), Local Government Authority (2017), Research Council UK (2017), Scottish Enterprise (2020a; 2020b; 2020e; 2020f), Scottish Funding Council (2020), UK Research and Innovation (2020a), Vavino et al. (2019).**

**Table 5: Design features of innovation and science policy instruments in the UK (2007-2020)**

| **Policy Instrument / Intervention** | **Industrial Strategy Challenge Fund (ISCF) Challenges (UK Research and Innovation)** |
|---|---|
| Design Feature | Description of Design Feature |
| ***Stringency*** | **Stringent:** A Monitoring Officer works with the firm during project to ensure terms and condition are met. |
| ***Level of Support*** | **High:** Firms compete for funding in different challenges with funds ranging from **£20 million up to £246 million**. |
| ***Predictability*** | **Relatively predictable:** Available since 2016/2017. Specific factors can change in different *Challenges*. |
| ***Flexibility*** | **Less flexible:** Must comply with the terms and conditions the Monitoring Officer outlines. |
| ***Differentiation*** | **Differentiated:** There can be **different criteria and funding available** depending on the *Challenge*. |
| ***Depth*** | **Deep:** Supports knowledge creation and the introduction of innovations to the market. |

| **Policy Instrument / Intervention** | **Innovate UK Smart grant (Innovate UK)** |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Relatively stringent:** Only SMEs are eligible to work alone. Applications from non-SMEs **must involve a micro firm or SME** in the application consortium. Once criteria are met, firms are able to work on projects in any field. |
| ***Level of Support*** | **High:** Supports projects with eligible costs **up to £2 million** in most cases. Supports projects for **below £3 million** in certain circumstances. |
| ***Predictability*** | **Relatively predictable:** Available since 2019. Any alterations have been to improve clarity of information and not to change the criteria themselves. |
| ***Flexibility*** | **Relatively flexible:** Specifies dates that the project must commence by and finish by. |
| ***Differentiation*** | **Differentiated:** Amount a firm can receive depends on the **type of project** it carries out and **firm size**. Different rates are offered for feasibility studies, and industrial research projects. |
| ***Depth*** | **Relatively deep:** Supports firms developing game-changing, disruptive ideas with the view to commercialisation. |

| **Policy Instrument / Intervention** | **Innovation Voucher (Innovate UK)** |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Relatively stringent:** Once a firm meets eligibility requirements, it can use the *Voucher*. The proposed partner cannot have worked with the firm before. |
| ***Level of Support*** | **Low:** Vouchers offer firms support worth up to **£5,000**. |
| ***Predictability*** | **Relatively predictable:** Available since 2012. |
| ***Flexibility*** | **Relatively flexible:** Firms can exchange the voucher with any knowledge provider. A firm cannot use the voucher with a partner it has already worked with. |
| ***Differentiation*** | **Less differentiated:** Available to **all firms** who meet eligibility requirements. |
| ***Depth*** | **Relatively deep**: Builds links between SMEs and HEIs for knowledge transfer. |

| **Policy Instrument / Intervention** | **Knowledge Transfer Partnership (KTP; Innovate UK)** |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent**: Firms are expected to make financial contributions to the project. Contributions can vary depending on the scale and length of the project. Typically, SMEs contribute circa £35,000 per year, roughly one-third of project costs. Large firms contribute circa £55,000 per year, or half of the project costs. |
| ***Level of Support*** | **Medium:** Average grant received by firms is **£77,338**. |
| ***Predictability*** | **Predictable:** Available under different names since 1975. Although the name has changed, and some small structural changes have been applied, the support has largely remained consistent. |
| ***Flexibility*** | **Relatively flexible:** The flexibility of a project can vary between Partnerships, depending on the agreement. |
| ***Differentiation*** | **Differentiated:** The specifics can change depending on the Partnership. The **contribution** firms must make is dependent on the **firm's size**. Larger firms are expected to contribute more than SMEs. |
| ***Depth*** | **Deep:** Bring in new skills and latest academic thinking to deliver a specific, strategic innovation project for firms. |

**Table 5: Design features of innovation and science policy instruments in the UK (2007-2020) (continued [1])**

| Policy Instrument / Intervention | Knowledge Transfer Network (KTN; Innovate UK) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Relatively stringent:** KTN does not have specific requirements itself. There may be further restrictions depending on the funding opportunities firms choose to pursue. |
| ***Level of Support*** | **Low:** KTN **does not fund firms**. Rather, it helps firms find funding opportunities or prepare for funding calls. |
| ***Predictability*** | **Relatively predictable:** Available as a single KTN since 2014. Prior to this there was several sector-specific KTNs. These were themselves an evolution of *Faraday Partnerships,* launched in 1997. |
| ***Flexibility*** | **Flexible:** The KTN programme itself has a long-term set of outputs and outcomes. Firms can make changes to the programme to maximise impact/respond to changing needs during funding period to achieve the outcomes. |
| ***Differentiation*** | **Less differentiated:** Available to **all firms** and other organisations. |
| ***Depth*** | **Relatively deep:** The KTN programme supports collaborations to promote and accelerate both the creation and adoption of innovations. It is focused on linking and convening innovators across sectors throughout the UK. |

| Policy Instrument / Intervention | Small Business Research Initiative (SBRI; Innovate UK) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Only firms who are successful in Phase 1 are eligible to continue to Phase 2. Funds the R&D that develops new products to address identified unmet public sector needs. Process is managed as a procurement contract which sets out the rigorous obligations and requirements that successful firms must comply with. |
| ***Level of Support*** | **High:** Phase 1 contracts are normally between **£50,000 and £100,000**. Firms in Phase 2 competitions usually receive between **£250,000 and £1 million**. There are no hard limits. The size of the competition depends upon the nature of the unmet need. SBRI funds 100% of the costs of the lead organisation conducting the R&D activity. |
| ***Predictability*** | **Predictable:** Available since 2004. |
| ***Flexibility*** | **Relatively flexible:** The flexibility of the SBRI can change depending on the competitions. There are no hard limits on maximum and minimum funding amounts per contract. |
| ***Differentiation*** | **Differentiated:** Competitions are split into **two phases**. Amount firms can receive varies depending on the phase. |
| ***Depth*** | **Relatively deep:** SBRI is pre-commercial procurement. It is about funding R&D to develop new insights, approaches and IP that can be shaped into products that are brought to market after the SBRI process is completed. |

| Policy Instrument / Intervention | Investment Accelerator pilot (Innovate UK) |
|---|---|
| Design Feature | Description of Design Feature |
| ***Stringency*** | **Stringent:** A Monitoring Officer is assigned to each firm to work with the firm throughout the project. The Officer ensures the project complies with Innovate UK's terms and conditions. |
| ***Level of Support*** | **High:** Covers 100% of a project costs. Projects are expected to cost **up to £150,000** funding is provided by Innovate UK and outside investors. |
| ***Predictability*** | **Relatively predictable:** Available since 2017. This policy intervention is at the pilot stage, with a view to full introduction depending on the success of the programme. |
| ***Flexibility*** | **Relatively flexible:** It is possible to make changes. The applicant must submit a project change request which needs to be approved by the Monitoring Officer and various teams. This process ensures that the change is reasonable and does not alter the scope of the project too significantly from what was originally assessed and deemed fundable. |
| ***Differentiation*** | **Less differentiated:** All SMEs can apply. Covers **100%** of project costs up to **£150,000**. *Innovate UK* provides up to 70% of eligible project costs in grant funding for micro or small firms, and up to 60% for medium-sized firms. Partner investors cover the remaining amount. |
| ***Depth*** | **Relatively deep:** Supports firms' knowledge creation in feasibility stage. Brings innovations to the market. |

**Table 5: Design features of innovation and science policy instruments in the UK (2007-2020) (continued [2])**

| Policy Instrument / Intervention | Innovation Loans (Innovate UK) |
|---|---|
| Design Feature | Description of Design Feature |
| ***Stringency*** | **Relatively stringent:** Firms must show that the loans and interest can be repaid. Firms do not need to repay the loan during the three-year availability period (with a possible two-year extension), but must repay the interest on the money borrowed. |
| ***Level of Support*** | **High:** £50 million has been spent across the five competitions. Firms can borrow between **£100,000 and £1 million**, to cover up to 100% of eligible project costs. |
| ***Predictability*** | **Relatively predictable:** Available since 2017. Part of a three-year pilot programme. There is a plan for a two-year extension consisting of two competitions with a proposed budget of £25 million. |
| ***Flexibility*** | **Relatively flexible:** Flexibility may change from competition to competition. SMEs can make use of an availability period extension (of up to two years) to establish a clear route to market and commercialisation. |
| ***Differentiation*** | **Less differentiated:** Once an **SME meets the criteria**, it will get support funding for up to 100% of eligible costs. Exact amounts may differ from competition to competition. |
| ***Depth*** | **Less deep:** More focused on bringing new innovations to the market. |

| Policy Instrument / Intervention | Innovation to Commercialisation of University Research (ICURe; Innovate UK) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Approved costs can only change if the Project Finance Team considers them to be overinflated. Generally, costs are not increased. A rare exception can be made where the 30% Academic rule may be slightly increased if the Industry Partner has to remove costs which were included but deemed ineligible. This increases the Academic percentage. |
| ***Level of Support*** | **Medium:** Initially, teams received funding for the salary and travel costs of the participating teams, who received grants of **up to £50,000**. However, upon implementation of the programme, this allocation was deemed too high and a new budget of **£35,000** was set, providing up to **£15,000** in salaries and **£20,000** in travel expenses to teams. Funding is limited to a maximum of 30% of the total eligible project costs. |
| ***Predictability*** | **Relatively predictable:** Available since 2014. Part of a pilot programme. |
| ***Flexibility*** | **Flexible:** Research teams receive a fixed amount. Teams can shape their projects and research. |
| ***Differentiation*** | **Less differentiated:** All research teams are eligible to apply and for **the same level** of funding. |
| ***Depth*** | **Deep:** Designed to help research teams commercialise their research finding and establish spin-off firms. |

| Policy Instrument / Intervention | The Catapult Network (Innovate UK) |
|---|---|
| Design Feature | Description of Design Feature |
| ***Stringency*** | **Stringent:** Firms are expected to make financial and in-kind contributions. The funding provided to Catapults is subject to a grant funding agreement which sets out the terms and conditions of the funding. |
| ***Level of Support*** | **High:** The *Catapult Network* is not a funding scheme that firms apply into and there are no set limits or funding percentages. Catapult Centres receive approximately **£10 million per year**. Firms may make contributions to the project the firm is collaborating on. The amount of funding may vary from Centre-to-Centre. |
| ***Predictability*** | **Predictable:** Available since 2011. New Centres have been established since, covering different topics. |
| ***Flexibility*** | **Flexible:** The funding provided to Catapults is for a long-term set of outputs and outcomes not for a specific project. Changes can be made during the funding period. However, the process depends on the specific nature of the change. |
| ***Differentiation*** | **Differentiated:** Available to all firms. Different Catapult Centres focus on different topics. |
| ***Depth*** | **Relatively deep:** Catapults are involved in both creating knowledge and bringing an innovation to market. |

| Policy Instrument / Intervention | Medical Research Council (MRC) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Firms who collaborate are expected to make financial and/or in-kind contributions. |
| ***Level of Support*** | **High:** The average level of funding is approximately **£990,000** per project between 2004 and 2016. |
| ***Predictability*** | **Predictable:** Available since 1913. In 2018, Research Councils UK became part of *UK Research and Innovation*. |
| ***Flexibility*** | **Relatively flexible:** Changes and extensions can be applied for during the project. Must be approved. |
| ***Differentiation*** | **Less differentiated:** Available to **all firms** to collaborate with. |
| ***Depth*** | **Deep:** Supports knowledge creation and commercialisation of research results. |

**Table 5: Design features of innovation and science policy instruments in the UK (2007-2020) (continued [3])**

| Policy Instrument / Intervention | Engineering and Physical Sciences Research Council (EPSRC; Research Councils) |
|---|---|
| ***Stringency*** | **Stringent:** Firms who collaborate are expected to make financial and/or in-kind contributions. |
| ***Level of Support*** | **High:** Exact level of support varies depending on the total number and value of proposals submitted to EPSRC. Average level of funding in the financial year 2017/2018 was **£875,000 per project**. |
| ***Predictability*** | **Predictable:** Available since 1994. Level of support may vary from project to project. In 2018, Research Councils UK became part of *UK Research and Innovation*. |
| ***Flexibility*** | **Relatively flexible:** Changes and extensions can be applied for during the project. Must be approved. |
| ***Differentiation*** | **Less differentiated:** Available to **all firms** to collaborate. Funds the universities, not the firms themselves. |
| ***Depth*** | **Deep:** Supports knowledge creation, and firms can commercialise new innovations in the market. |

| Policy Instrument / Intervention | Research & Development (R&D) Tax Relief (HMRC) |
|---|---|
| Design Feature | Description of Design Feature |
| ***Stringency*** | **Relatively stringent:** To claim the relief, firms must meet HMRC's definition of R&D. Firms applying for SME Scheme must qualify under HMRC's definition of an SME (less than 500 staff and a turnover of under €100 million or a balance sheet total under €86 million). |
| ***Level of Support*** | **High:** Firms can receive high levels of support, depending on the scheme applied for. Under the SME Scheme, firms can receive relief of **approximately 25%** from their corporation tax. Under the *Research and Development Expenditure Credit* (RDEC), which is mainly for large firms, firms can receive am **13%** tax credit. |
| ***Predictability*** | **Predictable:** Available since 2000. There have been many changes since this date, but all changes have seen R&D tax credit scheme become more generous. |
| ***Flexibility*** | **Relatively flexible**: Once minimum standard/strict definition of R&D is met, firms can claim for any eligible costs within the applicable scheme. |
| ***Differentiation*** | **Differentiated:** There are different schemes within the policy. The **SME Scheme** and **RDEC Scheme** offers different rates for the firms that qualify for them. |
| ***Depth*** | **Covers the full range of depth:** Flexibility means even tasks that are not focused on knowledge creation can avail of R&D tax credits. |

| Policy Instrument / Intervention | Enterprise Investment Scheme (EIS; HMRC) |
|---|---|
| Design Feature | Description of Design Feature |
| ***Stringency*** | **Stringent:** Firms must follow scheme rules so investors can claim and keep EIS tax reliefs relating to their shares. |
| ***Level of Support*** | **High:** Firms can raise up to a maximum of **£5 million a year**, up to £12 million in the firm's lifetime. |
| ***Predictability*** | **Predictable:** Available since 1993/1994, with some small changes in the structure since. Changes in 2020 focus approved funds on knowledge-intensive investments. |
| ***Flexibility*** | **Relatively flexible:** Some changes are allowed during the duration of the project. Changes must be justified. |
| ***Differentiation*** | **Differentiated:** There are different rules for **knowledge-intensive firms** that carry out a significant amount of R&D and innovation, and either: 1) want to raise more than £12 million in the firm's lifetime, or 2) did not receive investment under a venture capital scheme within 7 years of their first commercial sale |
| ***Depth*** | **Relatively deep:** Placed an emphasis on knowledge-intensive research, particularly with changes made in 2020. |

**Table 5: Design features of innovation and science policy instruments in the UK (2007-2020) (continued [5])**

| Policy Instrument / Intervention | Scottish Enterprise (SE) R&D Grant (Scottish Enterprise) |
|---|---|
| Design Feature | Description of Design Feature |
| ***Stringency*** | **Stringent:** For SMEs carrying out R&D which will result in a product for a commercial partner(s), commercial partner(s) must contribute a minimum 20% to the project costs. SE then support up to 45% of the remaining eligible project costs. |
| ***Level of Support*** | **High:** Grants cover between **35% - 50%** of eligible costs for SMEs. Grant covers 25% - 40% of eligible project costs for large firms. Offers large R&D grants worth **over £100,000**, and small R&D grants worth less than £100,000. |
| ***Predictability*** | **Predictable:** Available since 2004. Small changes in structure since this date. |
| ***Flexibility*** | **Relatively flexible:** Firms can contact SE through their grant manager to propose changes. Once it is approved, firms can implement changes. |
| ***Differentiation*** | **Differentiation:** SMEs working independently on innovative projects may be awarded between 35% - 50% of eligible projects costs. Large firms working independently on innovative projects may be awarded 25% - 40% of eligible costs. Offers large and small R&D grants worth over £100,000 and less than £100,000, respectively. |
| ***Depth*** | **Relatively deep:** Focuses on new innovation for firms, but not necessarily new knowledge. |

| Policy Instrument / Intervention | SMART: Scotland (Scottish Enterprise) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Relatively stringent:** Firm must meet SE's SME definition. Approval of an application is subject some criteria. The criteria are not demanding. SE assigns firms a grant manager who will oversees funding administration. |
| ***Level of Support*** | **High:** Offers grant support up to £100,000 (feasibility studies) and £600,000 (prototype development). |
| ***Predictability*** | **Predictable:** Available since 1999. Relaunched in 2007. There have been no recent changes in structure. |
| ***Flexibility*** | **Relatively flexible:** Changes are allowed if firms, through their grant manager, get approval for changes by SE. |
| ***Differentiation*** | **Differentiated:** A firm can receive different grants depending on whether it is conducting feasibility tests or developing prototypes. |
| ***Depth*** | **Deep:** Supports firms making advances in technological innovation for the UK industry or relevant sector. |

| Policy Instrument / Intervention | Regional Selective Assistance (RSA) funding (Scottish Enterprise) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Has strict criteria that must be meet. |
| ***Level of Support*** | **High:** Most grants are worth between £100,000 and £250,000. Grant outside of this range, either above or below, are also available. In 2018/19 firms across a range of sectors accepted 69 offers of RSA totalling £24.5 million. |
| ***Predictability*** | **Predictable:** Available since 1975. There have been small changes since then, but the structure has remained relatively consistent. Firms in the Scottish highlands and islands have not received a grant since 2016. |
| ***Flexibility*** | **Relatively flexible:** Firms can contact SE through their grant manager to propose changes. Once it is approved, firms can implement changes. |
| ***Differentiation*** | **Differentiated:** The maximum rate a firm can receive is dependent on the size and location of the firm. These factors are assessed before the grant is awarded. |
| ***Depth*** | **Less deep:** Funding covers a variety of projects. Innovation related projects can be funded. |

| Policy Instrument / Intervention | Standard Innovation Voucher (Interface) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** The firm contributes an equal value in cash or in-kind (such as staff time, materials, or equipment) or a combination of both. |
| ***Level of Support*** | **Low:** The voucher is worth up to €5,000. |
| ***Predictability*** | **Predictable:** Available since 2008. Structure has remained consistent. |
| ***Flexibility*** | **Flexible:** Firms can exchange the voucher at any of the Scottish HEIs. |
| ***Differentiation*** | **Differentiated:** Offers two different *Standard Innovation Vouchers*. There is the Product/Process/Service Innovation Voucher and Workforce Innovation Voucher. |
| ***Depth*** | **Deep:** Allows SMEs to develop knowledge from universities. Also focused on bringing innovation to the market. |

**Table 5: Design features of innovation and science policy instruments in the UK (2007-2020) (continued [5])**

| Policy Instrument / Intervention | Student Placement Innovation Vouchers (Interface) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** The firm contributes an equal value in-cash or in-kind (such as staff time, materials, or equipment) or a combination of both. SME receives the funding after the submission of the final report. |
| ***Level of Support*** | **Low:** Maximum level of support is £5,000. |
| ***Predictability*** | **Predictable:** Available since 2014. Structure has remained consistent. |
| ***Flexibility*** | **Less flexible:** SMEs must continue the project from the *Standard Innovation Voucher*. |
| ***Differentiation*** | **Differentiated:** Only firms who completed the Standard Innovation Voucher can participate. |
| ***Depth*** | **Deep:** Allows firms to strengthen their knowledge and aim to bring their innovation to the market. |

| Policy Instrument / Intervention | Advanced Innovation Vouchers (Interface) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Firms must be based in Scotland (given Interface's focus is on Scotland), and are expected to cover 50% of project costs through various scales of in-kind and in-cash contributions. |
| ***Level of Support*** | **Low:** Level of support ranges between £10,000 and £20,000. |
| ***Predictability*** | **Predictable:** Available since 2011. Structure has remained consistent. |
| ***Flexibility*** | **Flexible:** SMEs can exchange the voucher with any of the Scottish HEIs. |
| ***Differentiation*** | **Differentiated:** There are different contribution expectations for SMEs depending on the costs involved in the project. |
| ***Depth*** | **Deep:** Supports firms' knowledge creation. Also supports bringing new products to the market. |

**Sources of information used in compiling Table 5: Catapult (2020), Chapman & Hewitt-Dundas (2018), European Commission (2020a), Ernst & Young (2017), Fowkes et al. (2015), Her Majesty's Revenue and Commission (2016, 2017, 2019, 2020a, 2020b), Innovate UK (2015, 2017a, 2017b, 2017c; 2018; 2019a; 2019b; 2019c; 2019d; 2020a; 2020b; 2020c; 2020e), Interface (2020), Ipos MORI (2018), Knowledge Transfer Network (2020), Local Government Authority (2017), Research Council UK (2017), Scottish Enterprise (2020a; 2020b; 2020c; 2020d; 2020e; 2020f), Scottish Funding Council (2020), UK Research and Innovation (2020a; 2020b; 2020c), Vavino et al. (2019).**

## Section 3.3 Germany

There are many funding agencies/government bodies responsible for innovation and science policy instruments in Germany at the firm level. These include:

1. Federal Ministry of Education and Research (BMBF)

*Federal Ministry of Education and Research* (BMBF) is a cabinet-level ministry of Germany. The Ministry provides funding for research projects and institutions (aiming for research excellence) and sets general educational policy (BMBF, 2020a). BMBF aims at enhancing the innovative strength of Germany, creating sustainable employment, and improving the quality of education (European Commission, 2020b). At the firm level, BMBF helps implement several programmes to support Small and Medium-sized Enterprise (SME) innovation and assist firms' collaboration on international R&D projects (BMBF, 2020b). Since November 2019, BMBF has been responsible for the implementation and management of the new Research Allowance Act mandated R&D Tax Incentive (Ernst & Young Global, 2019).

2. Federal Ministry for Economic Affairs and Energy (BMWi)

*Federal Ministry for Economic Affairs and Energy* (BMWi) is a cabinet-level ministry of the Federal Republic of Germany. It was previously known as the Ministry of Economy. The central task of BMWi is to reinvigorate the social market economy, stay innovative in the long term and strengthen the social fabric in Germany (European Commission, 2020c). BMWi supports competitiveness and a high level of employment. To help firms in Germany conduct R&D, BMWi offers several different programmes and grants. This includes supports that focus on knowledge creation as well as bringing new innovations to the market (BMWI, 2020a). BMWi aims for German SMEs (known as the *Mittelstand*) to remain vibrant, strong, and innovative (BMWi, 2020a). BMWi seeks to foster clusters naturally formed between high-performing SMEs, large firms and research institutions in Germany (BMWI, 2020b).

3. Kreditanstalt für Wiederaufbau (Credit Institute for Reconstruction; KfW)

*Kreditanstalt für Wiederaufbau* (KfW) is a German state-owned development bank, based in Frankfurt. KfW seeks to promote areas of high political priority, including innovation (KfW, 2020). In 2018, KfW was the largest national development bank in the world, and by total assets, the third-largest bank in Germany (Banknoted, 2020). Its exemption from paying corporate taxes due to its legal status as a public agency and unremunerated equity provided by its public shareholders, allows KfW to provide loans at lower rates than commercial banks (NaSCA, 2020). KfW focuses on addressing market weaknesses without competing with commercial banks or crowding out private-sector enterprises (KfW, 2020). KfW has three business units with distinct functions, as well as several subsidiaries.

4. Regional Ministries

There are several regional ministries throughout Germany that support firms within specific regions. The *Baden-Württemberg Ministry of Economic, Labour and Housing* is responsible for, among other things, the promotion of the economy (with a particular focus on medium-sized firms), as well as business-related R&D (European Commission, 2020d). In 2008, Baden-

Württemberg was the first federal state to introduce innovation vouchers for SMEs (i.e. firms with less than 250 employees and either an annual turnover less than €50 million or an annual balance sheet total less than €43 million) (Baden-Württemberg Ministry of Economics, Labour and Housing, 2020). The *Ministry of Economic Affairs, Innovation, Digitalisation and Energy of the State of North Rhine-Westphalia* (MWIDE) aims to create optimal general conditions for firms in the state, and strengthen North Rhine-Westphalia as an innovative, forward-looking and attractive industrial location (European Commission, 2020e). MWIDE offers an Innovation and Digitalisation Voucher to help firms carry out innovation in the region through its overall SME Innovative & Digital programme (known in Germany as *Mittelstand Innovativ & Digital*) (MWIDE, 2020). The *Bavarian Ministry for Economic Affairs, Regional Development and Energy* offers support for firms through *Bayern Innovative* (Bayern Innovativ). *Bayern Innovative* offers the Bayern Innovation Voucher to help firms carry out innovation and support R&D (Bayern Innovative, 2020).

**Table 6: Innovation and science policy instruments available to firms in Germany (2007-2020)**

| **Policy Instrument / Intervention** | **Kleine und Mittelstandsunternehmen (KMU)-Innovativ / Small and Medium-sized Enterprise (SME) Innovative (First introduced in 2007)** |
|---|---|
| ***Agency responsible*** | Federal Ministry of Education and Research (BMBF) |
| ***Criteria / Eligibility Requirements*** | Available to SMEs within BMBF's *High-Tech Strategy*. The *SME Innovative programme* is not connected to a specific research topic, and there is no age limit for applicant firms. Important criteria for a positive funding decision are excellence, degree of innovation and the project's contribution to solving current socially relevant issues. Funding typically lasts between 25 and 36 months. Typical **maximum grant amounts** are between **€500,000 and €1 million**. |
| ***What is the support for?*** | Facilitates firm access to collaborative research networks operating within specialised programmes. It intends to shorten procedures for innovative research projects and make it easier to access funding to support cutting-edge research in the SME sector. Targeted support for SMEs. There is pilot service (Lotsendienst) for firms that have little or no experience with R&D projects. Service provides guidance on which support is appropriate and how to apply for funding, and, a simplified credit assessment to give small firms (1 – 50 employees) a better chance of obtaining funding. SMEs engaged in research receive special help with particularly high-risk projects. |
| ***Funding and scale*** | €1.266 billion, 2,900 SMEs (2007 – 2019) |

| **Policy Instrument / Intervention** | **Germany R&D Tax Incentive (First introduced in 2020)** |
|---|---|
| ***Agency responsible*** | Federal Ministry of Education and Research (BMBF) |
| ***Criteria / Eligibility Requirements*** | Available to all firms in Germany, with no size or sector bias. Eligible R&D activities include fundamental research, industrial research and experimental development. Initially intended to provide a 25% tax credit for eligible R&D costs up to €2 million (maximum credit: €250,000). Due to the 2020 Covid-19 pandemic, the R&D tax credit was restructured in June 2020 to offer **25% tax credit for eligible costs up to €4 million** (maximum credit - €1 million). Eligible expenses include (1) the wages subject to German wage tax, and (2) expenses for securing employees' future (e.g., contributions to statutory pension funds). Expenses are eligible only if employees conduct R&D activities in eligible projects. For contract research, the support applies to 60% of the fee the firm pays to the contractor (overall 15% of fees). |
| **What is the support for** | Incentivise firm-level R&D activities including **basic research, applied research and experimental development**. Projects should be novel, creative, uncertain, systematic, transferable and/or reproducible. The R&D tax credit does not include product development activities. The R&D tax credit enables firms to profit from the concession even during loss phases, making the incentive scheme attractive to new firms with start-up losses. |
| ***Funding and scale*** | The Research Allowance Act came into force on January 1st 2020. The application for this tax incentive is submitted with the firm's tax return at the end of the financial year. Therefore, at the date of publication of this report, no funding and scale information is available. |

**Table 6: Innovation and science policy instruments available to firms in Germany (2007-2020) (continued [1])**

| Policy Instrument / Intervention | Innovative Regional Growth Cores (IRGC; First introduced in 2001) |
|---|---|
| ***Agency responsible*** | Federal Ministry of Education and Research (BMBF) |
| ***Criteria / Eligibility Requirements*** | Available for collaborative R&D projects in firms (mainly SMEs) with research institutions, bound together by a joint strategy. For successful applicants, the IRGC provides non-repayable subsidies that can finance up to **50% (100%)** of the eligible costs incurred by **private firms (public research institutes or universities)**. In the context of these project-based subsidies, eligibility covers both investment and personnel expenditures, including the salaries of individuals administering the project. Ideas and activities of the regional innovation alliances should be oriented towards economic implementation from the beginning. BMBF therefore requires the alliances to have a well-founded, market-oriented strategy. |
| ***What is the support for*** | IRGC focuses on **regional alliances involving firms, universities and research institutes** that already have a joint technology platform in their region and boast unique selling points in their area of competence. The programme includes a specific aim to effectively use and develop the competences and resources available in East Germany. Aimed at developing innovative, economically successful products in the long run. |
| ***Funding and scale*** | €350.6 million, 51 initiatives (2001 – 2018) |

| Policy Instrument / Intervention | High Tech Start Up Fund (First introduced in 2005) |
|---|---|
| ***Agency responsible*** | Federal Ministry for Economic Affairs and Energy (BMWi) and Credit Institute for Reconstruction (KfW) |
| ***Criteria / Eligibility Requirements*** | Available to highly innovative and technology-oriented firms who are less than three years old. To be eligible, projects must have promising research findings, be based on innovative technology, and the product's market situation must be positive. An **initial funding amount** of up to **€1 million** is provided, with a total of **up to €3 million** usually available per firm across all financing rounds. The main target group are spin-offs from public research institutions and universities as well as corporate spin-offs. |
| ***What is the support for*** | Investing venture capital in young, high-opportunity technological firms **implementing promising research results** in an entrepreneurial manner. The fund provides technologically-oriented firms with start-up capital and ensures the necessary supervision and support for their management. |
| ***Funding and scale*** | €899.5 million investment volume, 500 firms (2005 – 2020) |

| Policy Instrument / Intervention | European Recovery Programme (ERP) Innovation Programme (First introduced in 2005) |
|---|---|
| ***Agency responsible*** | Federal Ministry for Economic Affairs and Energy (BMWi) |
| ***Criteria / Eligibility Requirements*** | Available to SMEs and self-employed people working in the professional-services sector. There are two parts of the programme which firms can apply for separately. **Part 1** focuses on providing funding for close-to-market research, and for the development of new products, processes, and services in Germany. Offers 100% financing of eligible R&D project costs up to €5 million. **Part 2** focuses on providing support for the launch of new products, processes, and services in Germany. Funding in Part 2 is different based on the firm's location. Firms in Western Germany can receive **up to 50%** funding of eligible costs, up to a maximum of **€1 million**. Firms in Eastern Germany can receive **up to 80%** funding, up to a maximum of **€2.5 million**. In most cases, to be eligible, firms' turnover must not be in excess of €125 million. This can be raised to €500 million if the project is deemed worthy of funding (e.g. if it is the first of its kind in Germany). Financing is available to cover the costs incurred during the development phase, up until the point where the product or service is ready for commercial use. Projects that are linked to German energy reforms are eligible for loans of up to €25 million per project. The cap for individual firms is €50 million per calendar-year. |
| ***What is the support for?*** | To **promote innovation** and to quickly **bring new practical applications to market**. The ERP innovation programme supports firms' innovation projects by providing long-term loans via the Credit Institute for Reconstruction (KfW), which are then paid out by the firm's high-street bank. |
| ***Funding and scale*** | Exact funding and scale unavailable. Support is capped at €50 million per year per firm. |

**Table 6: Innovation and science policy instruments available to firms in Germany (2007-2020) (continued [2])**

| Policy Instrument / Intervention | EXIST Business Start-up Grant (First introduced in 2007; Replaced the EXIST Seed programme which was first introduced in 2000) |
|---|---|
| ***Agency responsible*** | Federal Ministry for Economic Affairs and Energy (BMWi) |
| ***Criteria / Eligibility Requirements*** | Available to all students, graduates and scientists preparing innovative technology and knowledge-based start-up projects. Support is available to graduates or former research assistants (up to five years after graduation/leaving the institutes), students who have completed at least half of their study at the time of application, start-up teams of up to three people. One of the team members can be a person possessing a recognised vocational qualification or who completed university education more than five years ago. Maximum period of funding: one year. Subsistence grant depending on degree already obtained: – Doctorate: **€3,000/month** – Graduates: **€2,500/month** – Non-graduate professionals with a recognised vocational qualification: €2,000/month – Undergraduates or students: **€1,000/month** – Extra support for parents: €150/month/child. Material expenses: up to €10,000 for start-ups set up by an individual (up to € 30,000 for teams). Start-up-related coaching: €5,000 |
| ***What is the support for*** | Supports students, graduates and scientists in preparing **innovative technology and knowledge-based start-up projects**. Set up to fund early-stage start-ups from universities and other research institutes. The programme provides funding for the development of an idea for a product/service, and the business plan, up until firm launch. |
| ***Funding and scale*** | Exact funding and scale unavailable. Offers recipients funding up to €36,000 a year. |

| Policy Instrument / Intervention | EXIST Transfer of Research (First introduced in 2008) |
|---|---|
| ***Agency responsible*** | Federal Ministry for Economic Affairs and Energy (BMWi) |
| ***Criteria / Eligibility Requirements*** | Available to research teams at universities and research institutes. Supports the required resource development for technical feasibility of research-based start-ups and preparations to launch a firm. Funds from EXIST Transfer of Research can finance personnel expenses/costs for up to four positions as well as expenses/costs on materials and equipment. Expenses/costs relating to student assistants and materials/equipment are eligible for funding up to **€250,000**. Research institutes' projects which are funded by both state/government sources may be funded up to 90%. Projects from universities and other research institutes may be **funded up to 100%**. The funding period is generally up to 18 months. Periods of up to 36 months may be granted for highly innovative proposals that are verified to be time consuming and have the clearance of an expert jury. |
| ***What is the support for?*** | Funds both the resource development necessary to prove the technical **feasibility of start-up ideas based on research** and the preparation necessary to launch a firm. |
| ***Funding and scale*** | Exact funding and scale unavailable. Offers funding up to €250,000. |

| Policy Instrument / Intervention | go-Inno (Innovation Vouchers/Vouchers for Consultancy; First introduced in 2011) |
|---|---|
| ***Agency responsible*** | Federal Ministry for Economic Affairs and Energy (BMWi) |
| ***Criteria / Eligibility Requirements*** | Available to all firms who have business premises/headquarters in Germany, employ fewer than 100 people, and have annual turnover/balance sheet less than €20 million. Vouchers cover up to 50% of firm spending on external advisory services provided by a BMWi authorised consultancy firm. Firms can receive advice at two stages: **Stage 1** – Analysis of the potential (e.g. a Strengths, Weaknesses, Opportunities and Threats [SWOT] profile); **Stage 2** – Realisation concept and/or project management (e.g. finding suitable technology providers). The voucher value and maximum number of days' advice firms can receive depends on the stage. **Analysis of potential** – Maximum number of days: 8 – 10, Maximum value: €5,500; **Implementation** – Maximum number of days: 20 – 25, Maximum value: €13,750; **Project management** – Maximum number of days: 15, Maximum value: €8,250. A firm can use up to five innovation vouchers with a total funding value of up to €20,000 per calendar year. |
| ***What is the support for?*** | Supports firms by helping them **receive advice on innovation** with a view to professionalising firm innovation management. Helps firms identify innovative potential, draw up realisation strategies, and receive support with project management. |
| ***Funding and scale*** | Exact funding and scale unavailable. |

**Table 6: Innovation and science policy instruments available to firms in Germany (2007-2020) (continued [3])**

| Policy Instrument / Intervention | go-Digital (First introduced in 2017) |
|---|---|
| ***Agency responsible*** | Federal Ministry for Economic Affairs and Energy (BMWi) |
| ***Criteria / Eligibility Requirements*** | Available to SMEs in the commercial economy, including the skilled trades. SMEs must have technological potential, fewer than 100 employees (based on full-time equivalents), have an annual turnover or annual balance sheet total of at most €20 million in the year before the contract is concluded, and have eligibility under the *de minimis* regulation. The firm must have a permanent establishment or branch in Germany and, together with its partner firms and affiliated firms. A **maximum funding rate of 50%** for daily consulting rate of **€1,100**. As a beneficiary, a firm only pays own contribution to the consulting firm. The maximum amount of funding is 30 days within a period of six months. |
| ***What is the support for?*** | With its three modules Digitalised Business Processes, Digital Market Development, and IT Security, go-digital is aimed specifically at SMEs in the **commercial sector and the skilled trades**. The programme offers practical advice to keep pace with technological and social developments in online trading, digitalisation of everyday business and the increasing security requirements in digital networking. |
| ***Funding and scale*** | Exact funding and scale unavailable. €10 million budget per year. |

| Policy Instrument / Intervention | Mittelstand 4.0 Competence Centres / Digital Competence Centres for SMEs (First introduced in 2016) |
|---|---|
| ***Agency responsible*** | Federal Ministry for Economic Affairs and Energy (BMWi) |
| ***Criteria / Eligibility Requirements*** | Available to all SMEs in Germany. The projects within *Mittelstand-Digital* are completely funded by the BMWi. The BMWi issues an invitation to tender to which project consortia can apply. The project consortium describes in detail their action plan to achieve the objectives of the tender. Currently, there are **26 Mittelstand 4.0 Competence Centres**. Each centre aims to offer cross-sectoral and cross-thematic support. However, each centre has its own focus on research. These help the firm to first gauge its current stage of digitalisation, develop individual digitalisation road map, and assist it in the selection and implementation of suitable measures. The Centres are also at hand to advise firms on whether a technical solution is economically viable and which security aspects must be considered. |
| ***What is the support for?*** | Provide support to SMEs for digitalisation and work with similar tools. The centres are designed to be cross-sector and cross-thematic digitalisation ecosystems, **supporting knowledge and technology transfer to SMEs**. By offering workshops, demonstrations, and networks with representatives of the complete value chain, SMEs are practically supported in developing their own Industry 4.0 solutions. |
| ***Funding and scale*** | Exact funding and scale unavailable. |

| Policy Instrument / Intervention | Industrial Collective Research (IGF; First introduced in 1954) |
|---|---|
| ***Agency responsible*** | Federal Ministry for Economic Affairs and Energy (BMWi) |
| ***Criteria / Eligibility Requirements*** | Available to all firms that are part of partner consortia in Germany. The *Industrial Collective Research* (IGF) programme offers direct grants for R&D projects carried out by sectoral research institutions or (on behalf of these institutions) by consortia of firms and/or research organisations. The programme is solely accessible via sectoral research institutions that are members of the Federation of Industrial Research Association (AiF). These institutions have been founded by SMEs from certain sectors to carry out R&D in their joint interest. Institutions apply for funding opportunities on joint research initiatives. Exact funding amounts vary depending on the project. The **funding amount** is set at a maximum of **100% of expenses that are eligible** for funding. Exact funding amount varies depending on the project. Eligible research projects are scientific and technical that are cross-firm oriented, expect to generate new knowledge (especially in the area of the development and use of modern technologies), and can bring economic benefits to the group of SMEs. Applications for research projects must include proposals for the research that will transfer to the economy, statements on the feasibility of the project, and the project's economic importance. The special funding options CORNET (networks of research activities at international level through cross-border project cooperation), PLUS (with basic research projects or for implementation in processes, products and services) and control technologies for SMEs (multi-part research projects from various research associations at several research institute locations) expand the research opportunities of the IGF. |
| ***What is the support for?*** | The aim of promoting industry-wide collaborative research is to compensate for the structural disadvantages of SMEs in the field of research. As part of the IGF, SMEs can solve their common problems through **joint research activities**. Enables many SMEs to benefit from research results that could not have been achieved on their own. |
| ***Funding and scale*** | €169 million, 1,600 projects (2017) |

**Table 6: Innovation and science policy instruments available to firms in Germany (2007-2020) (continued [4])**

| Policy Instrument / Intervention | INNO-KOM - Research results for medium-sized companies (First introduced in 2009 as INNO-KOM-Ost) |
|---|---|
| ***Agency responsible*** | Federal Ministry for Economic Affairs and Energy (BMWi) |
| ***Criteria / Eligibility Requirements*** | Available to non-profit external industrial research institutions. *INNO-KOM* supports the effective technology and knowledge transfer between firms, start-ups, and research institutions. The results from funded projects should be made available to firms in a non-discriminatory manner. Firms can collaborate on or support certain projects. The amount institutions receive is based on the module their project qualifies for. **Module VF – preliminary research project**: Costs for the implementation of preliminary research projects are funded, provided that the costs deal with the results and findings of basic research, with regard to industrial or commercial areas of application, and that broad application options for medium-sized firms can be expected. Preliminary research projects can be applied for in cooperation with several non-profit industrial research institutions. Maximum grant amount: €550,000. Maximum grant rate: 90% of eligible costs. Eligible R&D personnel: Maximum involvement of 10% of total staff in VF project. Maximum running time: 30 months. **Module MF – market-oriented research and development project**: Funding is provided for the implementation of market-oriented research and development projects from the detailed concept through to readiness for production with the aim of winning new or further developed products, processes or services and, in particular, transferring them to SMEs in the manufacturing sector or, if necessary, utilising them. Activities for the transfer of application-ready research results are also supported. Maximum grant amount: €400,000. Maximum grant rate: 70% of eligible costs. Eligible R&D personnel: Maximum involvement of 50% of total staff in MF project. Maximum running time: 30 months. **Module IZ – investment grant**: Expenditures for investment measures to improve the scientific and technical infrastructure that enable an internationally appropriate standard of performance for research and development are funded. Maximum grant amount (less than 50 employees): €250,000 per institution and budget year. Maximum grant amount (more than 50 employees): €250,000 per institution and budget year. Maximum grant rate: 90% of eligible costs. Maximum running time: 12 months. |
| ***What is the support for?*** | Supports **projects from non-profit external industrial research institutions** that have their headquarters or a branch in the structurally weak regions of Germany. These regions are part of the GRW funding areas which is regularly updated. |
| ***Funding and scale*** | Exact funding and scale unavailable. €71 million was allocated to the programme in 2017. |

| Policy Instrument / Intervention | WIPANO – Knowledge Creation through Patents and Standards (First introduced in 2016) |
|---|---|
| ***Agency responsible*** | Federal Ministry for Economic Affairs and Energy (BMWi) |
| ***Criteria / Eligibility Requirements*** | Available to SMEs and public research institutes. Different schemes within programme. **Company – patenting** supports SMEs and members of liberal professions who want to secure their research and development (R&D) results through industrial property rights for the first time, or whose last property right application was made more than three years ago. The grant is awarded in the form of share financing (up to 50%), based on eligible expenditure. Eligible expenses are limited to €33,200. This means that up to €16,600 can be subsidised. **Public research – further development of inventions** supports universities and non-university research institutions in the identification, protection of property rights as well as the marketing of research results. Grant is awarded as a non-repayable grant. Funding takes the form of share financing (up to 70% of the eligible expenditure, total amount of funding per project is limited to €84,000). The expenditure for the contracts may not exceed 50% of the total expenditure. Maximum project duration: 24 months. **Knowledge transfer through standardisation** supports the transfer of research results into the economy. Maximum grant amount: €200,000. Maximum grant rate: up to 85% of eligible costs (Universities and non-university research institutions), up to 80% of eligible costs (Firms). **Company – standardisation** supports SMEs that want to actively participate in national, European, and international standardisation committees. The grant is awarded in the form of share financing (up to 70%), based on eligible expenditure. Grants up to €40,000 can be awarded. |
| ***What is the support for?*** | Promotes the patenting and exploitation of inventions and to **fund innovative (research) projects** on standardisation. Support for patenting aims to raise the awareness of the scientific community, industry, and the general public of the great significance of patents and property rights. Supports Higher Education Institutions (HEIs) and non-university research institutions, as well as SMEs. |
| ***Funding and scale*** | Exact funding and scale unavailable. |

**Table 6: Innovation and science policy instruments available to firms in Germany (2007-2020) (continued [5])**

| Policy Instrument / Intervention | Central Innovation Program for SMEs (ZIM; First introduced in 2008 – 2009) |
|---|---|
| ***Agency responsible*** | Federal Ministry for Economic Affairs and Energy (BMWi) |
| ***Criteria / Eligibility Requirements*** | Available to all SMEs based in Germany. Small: less than 50 employees, and an annual turnover/balance sheet of up to €10 million. Medium: less than 250 employees, annual turnover up to €50 million, and an annual balance sheet of less than €43 million. Allow some medium-sized firms with up to 500 employees. SMEs: Maximum Grant: €380,000. With International Collaboration: €450,000. Grant Rate: Between 25% and 55% depending on firm size, cooperation degree and location. Research Institutes (RIs): Maximum Grant: €175,000 (collaborative projects: €350,000). Grant Rate: 90% to 100%. Collaborative R&D Projects: Eligible Costs for support are €2 million. Eligible costs: Personnel costs; costs for project-related contracts to third parties; Lump-sum based on personnel costs. Firms: up to 100%. RIs: up to 75%). The technological innovation content and good market opportunities of the funded R&D projects are essential for approval. The firms can carry out research and development as individual projects or as cooperation projects with research institutions or other firms. In addition, the management and organisation of innovative corporate networks are promoted. ZIM also supports international partnerships both in cooperation projects and in networks. Funding rates for international cooperation networks: 95% - 40% of the costs in Phase 1 running up to 18 months (€190,000 per network). 80% – 40% of the costs in Phase 2 running up to 3 years (€260,000 per network). The level of funding declines over the years as part of project. Projects are coded as: EP – Individual R&D projects on firms; KA – Firm R&D projects involving the award of R&D contract to a research partner; KU – Collaborative projects between at least two firms; KF – Collaborative R&D project between at least one firm and one research institute; VP – Special type of KF. Collaborative across technology domain, at least four SMEs and two Research Establishments. The maximum grant rates are: **Small firms, West Germany** – EP: 40%, KA: 40%, KU: 45%, KF/VP: 45%. **Small firms, New Federal States and Berlin** – EP: 45%, KA: 45%, KU: 50%, KF/VP: 50%. **Medium firms, Western Germany** – EP: 35%, KA: 35%, KU: 40%, KF/VP: 40%. **Medium firms, New Federal States and Berlin** – EP: 35-45%, KA: 35-45%, KU: 45%, KF/VP: 45%. **Other medium firms with up to 500 employees, Western Germany** – EP: 25%, KA: 25%, KU: 30%, KF/VP: 30%. **Other medium firms with up to 500 employees, New Federal States and Berlin** – EP: 25%, KA: 25%, KU: 35%, KF/VP: 35%. **Research Institutes, Nation-wide** – KF/VP: 90-100%. |
| ***What is the support for?*** | **Supports innovation activities** by SMEs, including industry-science collaborations and technology transfer. Aims to sustainably strengthen the innovative strength and competitiveness of medium-sized firms. It is intended to contribute to economic growth, in particular by tapping value creation potential and raising the level of application-related knowledge. |
| ***Funding and scale*** | €4.2 billion, 30,000 collaboration projects (2009 – 2018) |

| Policy Instrument / Intervention | Kreditanstalt für Wiederaufbau (KfW; Credit Institute for Reconstruction) Capital (First introduced in 2018 – 2019) |
|---|---|
| ***Agency responsible*** | Kreditanstalt für Wiederaufbau (Credit Institute for Reconstruction; KfW Capital; wholly subsidiary of KfW) |
| ***Criteria / Eligibility Requirements*** | Available to young, innovative, technology-oriented, high-growth firms in Germany. KfW Capital invests in venture capital and venture debt funds, which then invests in the firms. KfW Capital invests **up to a maximum of €25 million** and a maximum of 19.99% of the fund's capital and voting rights. KfW Capital is also the largest investor in a series of co-investment funds which support SMEs in Germany, alongside the Federal Ministry for Economic Affairs and Energy (BMWi). KfW states that target funds should: generally, have a volume of at least €50 million and include mainly private investors; support young, innovative technology-oriented growth firms based in Germany; have clear investment and exit strategies. |
| ***What is the support for*** | Aims to improve the quality of venture capital funding. The aim is **to develop a product structure** where individual financing phases are coordinated throughout the firm's entire lifecycle. |
| ***Funding and scale*** | €156 million, 10 venture capital fund investments (2019) |

**Table 6: Innovation and science policy instruments available to firms in Germany (2007-2020) (continued [6])**

| Policy Instrument / Intervention | Enterprise Resource Planning (ERP) Digitisation and Innovation Loan (First introduced in 2017) |
|---|---|
| ***Agency responsible*** | Credit Institute for Reconstruction (KFW) |
| ***Criteria / Eligibility Requirements*** | Available to start-up firms and young firms. Support is provided for the digitisation of products, production processes and procedures. This includes the networking of production systems using Industry 4.0 technologies. The funding takes the form of a low-interest loan of **up to €25 million per project** and up to €7.5 million per financing needs of innovative firms. Funding is provided both for investments and for working capital. The bank processing the application can be relieved of up to 70% of its liability. A key feature of the funding is an optional liability release of 70% for loans granted to firms with fewer than 500 employees. The loan terms for SMEs are also more favourable. |
| ***What is the support for?*** | Serves to finance digitisation and **innovation projects** and investment and working capital for innovative firms. |
| ***Funding and scale*** | Exact funding and scale unavailable. Offers up to €25 million per project. |

| Policy Instrument / Intervention | Enterprise Resource Planning (ERP) Mezzanine Financing for Innovation (First introduced in 2017) |
|---|---|
| ***Agency responsible*** | Credit Institute for Reconstruction (KFW) |
| ***Criteria / Eligibility Requirements*** | Available to established commercial firms with an annual group turnover of up to €500 million and to professional service providers who have been active on the market for at least two years. The funding is provided as an integrated financial package consisting of a traditional loan and a subordinate loan, amounting to a **maximum of €5 million per project** |
| ***What is the support for*** | ERP is designed for long-term financing of **market-related R&D** for new products, production processes and services. |
| ***Funding and scale*** | Exact funding and scale unavailable. Supports firms up to €5 million per project. |

| Policy Instrument / Intervention | Innovation vouchers Baden-Württemberg (First introduced in 2008) |
|---|---|
| ***Agency responsible*** | Ministry of Economics, Labour and Housing Baden-Württemberg |
| ***Criteria / Eligibility Requirements*** | Available to SMEs in the commercial sector and the liberal professions with headquarters in Baden-Württemberg. Start-ups who will set up in Baden-Württemberg are also eligible. There is a maximum firm size of up to 100 employees and a previous year's turnover or balance sheet total of a maximum of €20 million (including all partner and affiliated firms). Funds the use of external R&D services. There are two different vouchers with different levels of support and applications. Firms can only receive one type of voucher once each per calendar year. **Voucher A:** covers up to 80% of eligible costs, up to a maximum amount of €2,500. Firms must pay the difference in costs. Voucher A is used for scientific activities in the run-up to the development of an innovative product, an innovative service or a process innovation. These activities include technology, patent or market research, feasibility, material or design studies or studies on manufacturing technology. Firms must show proof of at least €3,125 in eligible expenses from the commissioned R&D facility. **Voucher B:** covers up to 50% of eligible costs, up to a maximum amount of €5,000. Voucher B is used for implementation-oriented research and development activities. These activities are aimed at creating and developing innovative products, services, or processes until they are ready for the market. Firms must show proof of at least €10,000 in eligible expenses from the commissioned R&D facility. Within Voucher B, High Tech Vouchers were introduced in 2012. High Tech digital and High Tech mobility vouchers were added in 2017. **High Tech Vouchers:** covers up to 50% of eligible costs, up to €20,000. High Tech Vouchers support the implementation of research and development orientated activities, material costs as part of an innovative project and the development and implementation of sophisticated digital products or services. Firms must show proof of at least €40,000 in eligible expenses from the commissioned R&D facility. |
| ***What is the support for?*** | Supports SMEs in **planning, developing, and implementing innovative** products, services and production processes or in their essential qualitative further development. |
| ***Funding and scale*** | **Vouchers A and B in total:** €6.2 million, 1,100 projects (2015 – 2019)<br>**High Tech Vouchers:** €10.6 million, 500 projects (2015 – 2019) |

**Table 6: Innovation and science policy instruments available to firms in Germany (2007-2020) (continued [7])**

| Policy Instrument / Intervention | SME Innovative and Digital Voucher (Mittelstand Innovativ & Digital [MID] – vouchers) |
|---|---|
| ***Agency responsible*** | Mittelstand Innovativ & Digital (Under the Ministry of Economics, Innovation, Digitalisation and Energy of the State of North Rhine-Westphalia [MWIDE]) |
| ***Criteria / Eligibility Requirements*** | Available to SMEs based in North Rhine-Westphalia. SME must have fewer than 250 employees and an annual turnover of a maximum of €50 million or a balance sheet total of a maximum of €43 million can apply for a MID voucher. Three types of vouchers are offered, each of which has different goals and is endowed differently. **MID Digitisation voucher:** analysis and implementation of digitisation solutions. Digitisation vouchers fund micro and small firms for up to 50% of eligible costs, and medium-sized firms up to 30% of eligible costs. Funding for all firms is capped at €15,000. **MID Analysis voucher:** entrepreneurs can draw on scientific and technological expertise from universities and research institutions. This gives them the opportunity to check the feasibility of the projects, to examine suitable materials, or to analyse future topics before the next step. Analysis vouchers fund micro and small firms 80% of eligible costs. Medium-sized firms are funded up to 60%. Funding for all firms is capped at €15,000. **MID Innovation voucher:** SMEs can have prototypes built, test and adapt innovative products, services and production processes and further develop them until they are ready for the market or use. To receive the voucher, firms must have results from a preliminary study available. Only universities and research institutions can be commissioned for the development work. Innovation vouchers fund micro and small firms 50% of eligible costs. Medium-sized firms are funded up to 30%. Funding for all firms is capped at €40,000. |
| ***What is the support for?*** | Supports SMEs with **technology transfer**, with external analyses and development work by universities and research institutions. Provides advice on the implementation of digitisation projects. |
| ***Funding and scale*** | Exact funding and scale unavailable. Support for firms is capped at €40,000. |

| Policy Instrument / Intervention | Bavarian Innovation Voucher |
|---|---|
| ***Agency responsible*** | Bayern Innovativ (Bavarian Ministry for Economic Affairs, Regional Development and Energy) |
| ***Criteria / Eligibility Requirements*** | Available to small firms, freelances and craft trade firms operating in Bavaria. Small firms have fewer than 50 employees and a previous year's turnover or balance sheet total of no more than €10 million (including all related enterprises). The funding level is generally 40% and can be increased to a maximum of 60% in regions which are deemed in special need for action or when commissioning a university or non-university research institution. There are different innovation vouchers available. **Innovation voucher 1:** Used for planning, development and implementation of new products, production processes or services and/or significant improvements to existing products, production processes and services in the field of technical and/or technological innovations. The upper limit for funding is €15,000. Innovation voucher 2: Used for innovative projects with a greater need for financing and an external order volume of at least €25,000. Upper limit for funding is €30,000. **Special innovation voucher:** Continuation of successful projects (using innovation voucher 1 and 2) with greater need for financing. The upper limit for funding is €80,000. Several innovation vouchers may be granted within the framework of an innovation project. A maximum of five innovation vouchers can be granted per applicant within three years. |
| ***What is the support for?*** | Supports small firms and craft trade firms in **planning and implementing new or improved** products, production processes or services from an idea. |
| ***Funding and scale*** | Exact funding and scale unavailable. The upper limit for funding is €80,000. |

**Sources of information used in compiling Table 6: Baden-Wurttemburg Ministry of Economics, Labour, and Housing (2020), Bayer Innovativ (2020), Belitz, et al. (2013); Binder Dijker Otte & Co. (2020), Crunchbase (2020), Data One (2020), Ernst & Young (2019), European Commission (2020b, 2020c; 2020d; 2020e), Federal Ministry for Economic Affairs and Energy (2019a; 2019b; 2019c; 2019d; 2019e; 2019f; 2019g), Federal Ministry of Education (2020a; 2020b), German Digital Technologies (2020), Kreditanstalt für Wiederaufbau (2020), Ministry of Economic Affairs, Innovation, Digitalisation and Energy of the State of North Rhine-Westphalia (2020), SME Innovative and Digital (2020), Ministry of Economic Affairs, Innovation, Digitalisation and Energy of the State of North Rhine-Westphalia (2020), The Association of Industrial Research Organisations (2020).**

**Table 7: Design features of innovation and science policy instruments in Germany (2007-2020)**

| Policy Instrument / Intervention | German R&D Tax Incentive (Federal Ministry of Education and Research [BMBF]) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent**: Firms must complete a two-stage application process: 1) Application for an R&D certificate at the certification office for research allowance (Bescheinigungsstelle Forschungszulage – BSFZ); 2) Application for research allowance at the tax office. The BSFZ determines whether the project is eligible for funding, according to a set definition of basic research, experimental development, and industrial development. The procedure is regulated by the Research Allowance Certification Ordinance. |
| ***Level of Support*** | **High**: **25% tax credit** applies to all eligible R&D expenditure. |
| ***Predictability*** | **Relatively predictable:** Available since January 1st 2020. Structure updated in June 2020 in response to global Covid-19 pandemic. Rate remained at 25%. Eligible expenses raised from €2 million to €4 million. |
| ***Flexibility*** | **Relatively flexible**: Once minimum standard/definition of R&D is met, firms can claim for any eligible costs. |
| ***Differentiation*** | **Less differentiated**: Available to **all firms**. For contract research, the support applies to 60% of the fee the firm pays to the contractor (overall 15% of fees). |
| ***Depth*** | **Covers the full range of depth**: Firms can claim the R&D tax credit for any eligible expenditure, from knowledge creation to commercialisation. |

| Policy Instrument / Intervention | Kleine und Mittelstandsunternehmen (KMU)-Innovativ / Small and Medium Enterprise (SME) (Federal Ministry of Education and Research [BMBF]) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** In addition to EU regulations for R&D funding, the general regulations of the BMBF, firms draw down funding based on Kostenbasis, meaning that only certain costs can be claimed. |
| ***Level of Support*** | **High:** Typical maximum grants are between **€500,000 and €1 million**. |
| ***Predictability*** | **Predictable:** Available since 2007. Structure has remained largely consistent. There have been no major changes in the last 5 years. Some funding calls have been amended to address technical progress in specific technology fields. New funding calls consistently arise to address new technologies and new areas of funding. |
| ***Flexibility*** | **Relatively flexible:** Some room for changes as the project progresses as long as changes can be justified. |
| ***Differentiation*** | **Relatively differentiated:** Mainly **available to SMEs**. However, offers pilot service (Lotsendienst) for firms that have little to no previous experience with realising R&D projects. It provides guidance on which support is appropriate and how to apply for funding. |
| ***Depth*** | **Deep:** Supports SMEs in their innovation process. It intends to shorten procedures for innovative research projects and make it easier to access funding. |

| Policy Instrument / Intervention | Innovative Regional Growth Cores (IRGC; Federal Ministry of Education and Research [BMBF]) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Relatively stringent:** In addition to written reporting requirement for funded research and development projects, there are further obligations. All alliance partners, including firms, are required to hold an annual strategy workshop to further develop their strategy (written in the preceding concept phase), and hold a public event to publicise their *Growth Core*. |
| ***Level of Support*** | **High:** IRGC provides non-repayable subsidies that can finance up to **50% (100%)** of the eligible costs incurred by **private firms (public research institutes or universities)**. |
| ***Predictability*** | **Predictable:** Available since 2001. Structure has remained consistent. |
| ***Flexibility*** | **Relatively flexible:** Changes must be requested informally in writing. Examples include changes to the work plan (e.g. awarding a contract instead of own work, delay in research work, etc.) or change of project manager. The funding agency will examine whether the achievement of objectives still appears to be guaranteed by the proposed changes and how this will affect the project partners. If, for example, additional funds are required, reviewers who may have been involved in the funding decision can be asked for their comments again. After the decision has been made, the grant recipient will receive an informal letter from the promoter or a notification of amendment, depending on the type of amendment. |
| ***Differentiation*** | **Differentiated:** Different rates apply **depending on which organisation** makes the application. Firms receive up to 50% of the eligible costs incurred. Public research institutes or universities receive subsidies of up to 100% of the eligible costs. |
| ***Depth*** | **Relatively deep:** Aims to develop innovative, successful products in the market and increase regional added value. |

**Table 7: Design features of innovation and science policy instruments in Germany (2007-2020) (continued [1])**

| Policy Instrument / Intervention | High Tech Start-Up fund (Federal Ministry of Economic Affairs and Energy [BMWi]) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Relatively stringent:** Once eligibility requirements are met, firms have a degree of freedom. Ensures firms receive necessary supervision and support to help manage funds. |
| ***Level of Support*** | **High:** An initial funding amount of **up to €1 million** is provided, with a total of **up to €3 million** usually being available per firm across all financing rounds. |
| ***Predictability*** | **Predictable:** Available since 2005. Currently in its third wave of funding. |
| ***Flexibility*** | **Relatively flexible:** Firms can avail of flexible financing options during the programme. Can be adjusted to suit the needs of the programme. Maximum funding across all financing rounds is €3 million. |
| ***Differentiation*** | **Relatively differentiated:** Amount of funding received is **dependent on firm, project, and investment round**. |
| ***Depth*** | **Relatively deep:** Supports firms applying promising research results to the market. |

| Policy Instrument / Intervention | European Recovery Programme (ERP) Innovation Programme (Federal Ministry of Economic Affairs and Energy [BMWi]) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Firms that apply under 'small firms' programme must meet the EU SME definition: have less than 250 staff and have annual turnover less than €50 million, and/or balance sheet total less than €43 million). |
| ***Level of Support*** | **High:** Offers support of up to 100% of project costs, **up to €5 million** per project. |
| ***Predictability*** | **Predictable:** Available since 2005, with only small changes in structure since this date. |
| ***Flexibility*** | **Relatively flexible:** Justifiable changes can be allowed during the project. |
| ***Differentiation*** | **Differentiated: Special support** is given to projects for the **development of technologies** that render the generation, storage, and transmission of energy more efficient. Projects linked with energy reform are eligible for loans up to €25 million per project (maximum €50 million per firm). |
| ***Depth*** | **Relatively deep:** Supports firms carrying out innovative projects, with special support for 'first of its kind' projects. Focused on introducing innovations to the market. |

| Policy Instrument / Intervention | EXIST Start-up Business Grant (Federal Ministry of Economic Affairs and Energy [BMWi]) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Relatively stringent:** Firms are given necessary autonomy to conduct research. A presentation of preliminary results in month 5 (mid-project) is held to address problems and find solutions. |
| ***Level of Support*** | **Low:** Maximum grant is **€3,000 a month**, depending on eligibility. |
| ***Predictability*** | **Predictable:** Available since 2007. Replaced the *EXIST SEED programme*. Structure has remained consistent. |
| ***Flexibility*** | **Relatively flexible:** Some changes can be made depending on mid-project review if they can be justified. |
| ***Differentiation*** | **Differentiated:** Offers different subsistence grant **depending on degree already obtained** by the applicant. |
| ***Depth*** | **Relatively deep:** Supports students, graduates and scientists in preparing innovative technology and knowledge-based start-up projects. Maximum duration of funding is one year. |

| Policy Instrument / Intervention | EXIST Transfer of Research (Federal Ministry of Economic Affairs and Energy [BMWi]) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Funded projects are monitored by BMWi. BMWi engage in detailed discussions with firm representatives throughout the project lifetime. |
| ***Level of Support*** | **High:** Expenses/costs relating to student assistants and materials/equipment are eligible for **funding up to €250,000**. Research institutes' projects which are funded by both state/government sources may be funded up to 90%. Projects of universities and other research institutes may be funded up to 100%. |
| ***Predictability*** | **Predictable:** Available since 2008. Structure has remained consistent. |
| ***Flexibility*** | **Relatively flexible:** Increased funding duration can be awarded for highly innovative proposals that are verified to be time consuming and have the clearance of an expert jury. |
| ***Differentiation*** | **Differentiated:** The funding period is generally up to 18 months. Periods of **up to 36 months** may be granted **for highly innovative firms**. |
| ***Depth*** | **Deep:** Offers increased support for highly innovative projects. |

**Table 7: Design features of innovation and science policy instruments in Germany (2007-2020) (continued [2])**

| Policy Instrument / Intervention | go-Inno (Innovation Vouchers/Vouchers for Consultancy; Federal Ministry for Economic Affairs and Energy [BMWi]) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Relatively stringent:** There is a set maximum amount of days where a firm can receive advice. Allows firms to use the voucher at any approved consultancy firm. |
| ***Level of Support*** | **Low:** Covers 50% of firms' consultancy costs. The maximum value of vouchers is between **€5,500 and €13,750**. |
| ***Predictability*** | **Predictable:** Has been available since 2011. |
| ***Flexibility*** | **Flexible:** Allows for additional days of advice in the '*Analysis of Potential and Implementation'* stage if further experts become involved. |
| ***Differentiation*** | **Differentiated:** The vouchers value and maximum number of days' advice which firms can receive depends on the stage. **Analysis of potential** – Maximum number of days: 8 – 10, Maximum value: €5,500; **Implementation** – Maximum number of days: 20 – 25, Maximum value: €13,750; **Project management** – Maximum number of days: 15, Maximum value: €8,250. |
| ***Depth*** | **Relatively deep:** Allows firms to receive knowledge and advice. Process is carried out over a few weeks at most. |

| Policy Instrument / Intervention | go-Digital (Federal Ministry for Economic Affairs and Energy [BMWi]) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Support is broken into modules that cover specific topics. The three main modules are digitalised business processes, digitalised market development and IT security. Funding is only for the three main modules and any approved secondary modules. |
| ***Level of Support*** | **Low:** A maximum funding rate of 50% for daily consulting rate of **€1,100**. As a beneficiary, firm only pays own contribution to the consulting firm. The maximum funding amount/duration is 30 days within six months. |
| ***Predictability*** | **Predictable:** Available since 2017. Structure has remained consistent. |
| ***Flexibility*** | **Relatively flexible:** Firms can avail of certain secondary modules within programme, but they must be approved. |
| ***Differentiation*** | **Differentiated:** go-Digital offers **three modules** for firms to take part in: 1) Digitalised Business Processes, 2) Digital Market Development, and 3) IT Security. |
| ***Depth*** | **Relatively deep:** Support firms in their digital transformation process. |

| Policy Instrument / Intervention | Mittelstand 4.0 Competence Centres / Digital Competence Centres for SMEs (Federal Ministry for Economic Affairs and Energy [BMWi]) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Relatively stringent:** The exact stringency measures may vary depending on the Centre. |
| ***Level of Support*** | **High:** The annual budget amount is about €36 million a year (**€1.5 – 2 million per *Competence Centre***). The source of funding is the federal budget (100%). |
| ***Predictability*** | **Relatively predictable:** Available since 2016. Specifications may change from Centre-to-Centre. |
| ***Flexibility*** | **Relatively flexible:** Some changes can be allowed. |
| ***Differentiation*** | **Relatively differentiated:** *Competence Centres* try to offer support for **all firms**. However, the focus of their research can differ from centre to centre. |
| ***Depth*** | **Less deep:** Aims to increase firms' digital competencies. |

| Policy Instrument / Intervention | Industrial Collective Research (IGF; Federal Ministry for Economic Affairs and Energy [BMWi]) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Firms, research institutes and universities must be part of sectoral research institutions that are members of the *Federation of Industrial Research Association* (AiF). Applications for research projects must include proposals for the transfer to the economy, statements on the feasibility and economic importance. |
| ***Level of Support*** | **High:** Cover **100% of eligible costs** for projects. Funding offers depend on the project. Average project cost in 2017 was **€105,625**. |
| ***Predictability*** | **Predictable:** Available since 1954. Structure has changed over time but has remained consistent. |
| ***Flexibility*** | Relatively flexible: Some changes can be made during the process. |
| ***Differentiation*** | **Differentiated:** Offers special funding options CORNET (networks research activities at international level through cross-border project cooperation), PLUS (with flanked basic research projects or for implementation in processes, products and services) and Control technologies for SMEs (multi-part research projects from various research associations at several research institute locations) expand the research opportunities of the IGF. |
| ***Depth*** | **Relatively deep:** Allows firms, research institutes and universities to collaborate. |

**Table 7: Design features of innovation and science policy instruments in Germany (2007-2020) (continued [3])**

| Policy Instrument / Intervention | INNO-KOM - Research results for medium-sized companies (Federal Ministry for Economic Affairs and Energy [BMWi]) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Divides research into 'modules', which specify what qualifies as research in different project types. Different modules offer different levels of support. |
| ***Level of Support*** | **High:** Maximum grant received, and grant rate can vary depending on the module the project qualifies for. Maximum grant amount that a firm can receive is up to €550,000. |
| ***Predictability*** | **Predictable:** Available since 2009. Initially supported technology transfer of non-profit industry research facilities in eastern Germany as *INNO-KOM-Ost*. In 2017, the model was expanded to structurally weak regions throughout Germany. |
| ***Flexibility*** | **Relatively flexible:** Changes can be made, if approved first. |
| ***Differentiation*** | **Differentiated:** The amount institutions receive is based on the module their project qualifies for. The maximum rate and grant differ depending on what the project qualifies as. Preliminary research project can receive up to €550,000 or 90% grant. Market orientated research and development project can receive up to €400,000 or 70% grant. Investment grant can receive up to €250,000 or 90% grant. |
| ***Depth*** | **Deep:** Supports the effective technology and knowledge transfer between firms, start-ups, and research institutions**.** |

| Policy Instrument / Intervention | WIPANO – Knowledge Creation through Patents and Standards (Federal Ministry for Economic Affairs and Energy [BMWi]) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Different schemes have different requirements that must be enforced. For example, as part of the *Knowledge Transfer Through Standardisation* scheme, there are specific requirements for universities and firms. **Universities and non-university research institutions:** At least one cooperation partner must be a firm. The university / non-university research institutions must account for a maximum of 70% of eligible staff. **Firm:** At least one cooperation partner must be a publicly funded research institution. Firms must account for at least 30% of the eligible staff. |
| ***Level of Support*** | **Medium:** Amount changes depending on the scheme being availed of **€200,000** for *Knowledge Transfer Through Standardisation.* |
| ***Predictability*** | **Predictable:** Available since 2016. Structure has remained the same. |
| ***Flexibility*** | **Relatively flexible:** Firms have areas for change within programme. Certain schemes have specific requirements. |
| ***Differentiation*** | **Differentiated:** Different schemes within programme. **Different organisations** are eligible to in each scheme. |
| ***Depth*** | **Deep:** Aims to create and transfer knowledge and research throughout the economy and society. |

| Policy Instrument / Intervention | Central Innovation Program for SMEs (ZIM; Federal Ministry for Economic Affairs and Energy [BMWi]) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Relatively stringent:** There are different regulations depending on the project type, and whether there is international collaboration. |
| ***Level of Support*** | **High:** Maximum grant amounts and rates depend on the recipient and whether there is collaboration. SMEs: **Maximum Grant: €380,000**. With International Collaboration: **€450,000**. Grant Rate: Between **25% and 55%** depending on firm size, cooperation degree and location. Research Institutes: Maximum Grant: €175,000 (collaborative projects up to €350,000). Grant Rate: **90% to 100%**. Collaborative R&D Projects: Eligible Costs for support are €2 million. |
| ***Predictability*** | **Predictable:** Available since 2008 for firms with less than 250 employees. Since 2015, firms with between 251 and 499 employees are eligible. |
| ***Flexibility*** | **Relatively flexible:** Some changes can be made. International projects may need international partner's approval. |
| ***Differentiation*** | **Differentiated:** Different amounts of support can be offered **depending on the project type**. |
| ***Depth*** | **Deep:** Aims to sustainably strengthen the innovative capabilities and competitiveness of SMEs. It is intended to contribute to economic growth, in particular by increasing the value creation potential and raising the level of application-related knowledge for firms. |

**Table 7: Design features of innovation and science policy instruments in Germany (2007-2020) (continued [4])**

| Policy Instrument / Intervention | Kreditanstalt für Wiederaufbau (KfW; Credit Institute for Reconstruction) Capital (Kreditanstalt für Wiederaufbau (KfW; Credit Institute for Reconstruction) Capital) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Firms must comply with regulations set out in advance. |
| ***Level of Support*** | **High:** Provides funding for other venture capital funds, at **maximum invest €25 million** per venture capital fund. |
| ***Predictability*** | **Relatively new instrument:** 2019 was its first financing year. Too early to state predictability. |
| ***Flexibility*** | **Relatively flexible:** Invests in other venture capital funds. The exact specifications vary from fund-to-fund. |
| ***Differentiation*** | **Differentiated:** Supports **different funds within programme**, which can offer various grants to firms. |
| ***Depth*** | **Relatively deep:** Invests in venture capital and venture debt funds, which in turn invest in young, innovative technology-oriented growth firms in Germany, strengthening the capital base of these firms. |

| Policy Instrument / Intervention | Enterprise Resource Planning (ERP) Digitisation and Innovation Loan (KfW) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Relatively stringent:** As firms receive loan from banks, stringency is dependent on the bank and their rules. |
| ***Level of Support*** | **High:** The maximum funding is **up to €25 million** per project through a low interest rate loan and **up to €7.5 million** per financing needs of innovative firms. |
| ***Predictability*** | **Relatively predictable:** Available since 2017. Structure has remained consistent. |
| ***Flexibility*** | **Relatively flexible:** Exact flexibility and regulations vary from project to project, and bank to bank. |
| ***Differentiation*** | **Differentiated:** Offers an optional liability release of 70% for loans granted to firms with fewer than 500 employees. |
| ***Depth*** | **Less deep:** Focused on financing digitisation and innovation projects in a broad range of areas. |

| Policy Instrument / Intervention | Enterprise Resource Planning (ERP) Mezzanine Financing for Innovation (KfW) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Relatively stringent:** Must meet criteria to avail of funding. |
| ***Level of Support*** | **High:** Investment can be worth **up to €5 million** per project. |
| ***Predictability*** | **Relatively predictable:** Available since 2017. Structure has remained consistent. |
| ***Flexibility*** | **Relatively flexible:** Some small changes are available. Maximum funding is €5 million per project. |
| ***Differentiation*** | **Differentiated:** Funding of €200 million is invested in various venture capital funds. |
| ***Depth*** | **Less deep:** Focuses on bringing innovations to the market. |

| Policy Instrument / Intervention | Innovation vouchers Baden-Württemberg (Ministry of Economics, Labours and Housing Baden-Wurttemberg) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Firms must complete reports and present a statement of expenditure to receive funding. |
| ***Level of Support*** | **Low:** The maximum values are **€2,500**, **€5,000,** and **€20,000** for each of the respective vouchers. |
| ***Predictability*** | **Predictable:** Available since 2008. Added in more vouchers in the form of the *High Tech Vouchers* in 2012 and 2017. |
| ***Flexibility*** | **Less flexible:** Firms are awarded a specific level of funding. Any deviations away from that are expected to be covered by the firm. |
| ***Differentiation*** | **Differentiated:** Offers two different types (type A or type B) of vouchers that support firms in different areas. Voucher A supports scientific development. Voucher B focuses on bringing new innovations to the market. |
| ***Depth*** | **Relatively deep:** Voucher A can support firms' knowledge creation through scientific development. However, Voucher B is focused on bringing new innovations to the market. |

**Table 7: Design features of innovation and science policy instruments in Germany (2007-2020) (continued [5])**

| Policy Instrument / Intervention | SME Innovative and Digital Voucher (Mittelstand Innovativ & Digital [MID] vouchers; Mittelstand Innovativ & Digital) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Funding is based on the expenditure reimbursement principle, in which the firms first make advance payments and are reimbursed the funding portion after the project is completed. |
| ***Level of Support*** | **Low:** Firms can receive up to **€15,000** through *Digitisation and Analysis Vouchers*, and **€40,000** through *Innovation Vouchers*. |
| ***Predictability*** | **Predictable:** The portion of the reimbursement (funding rate) is usually 50% for small firms, and 30% for medium-sized firms. In order to be able to emerge digitally strengthened from the Covid-19 crisis, the funding quotas for all applications received by December 31st 2020 will be increased to 80% for small firms. For medium-sized firms, there is a higher funding rate of 60%. The maximum funding amount is still up to €15,000. |
| ***Flexibility*** | **Less flexible:** Firms receive their funding reimbursement after the project is completed. Must adhere to the agreed plan. |
| ***Differentiation*** | **Differentiated:** Offers **three different vouchers** that offer different levels of support and focus on different parts of the innovation process. |
| ***Depth*** | **Deep:** Supports firms in their knowledge creation and transfers. Analysis vouchers focus more on the knowledge, while Innovation vouchers focus more on bringing new innovations to the market. |

| Policy Instrument / Intervention | Bavarian Innovation Vouchers (Bayern Innovativ [Bavarian Ministry for Economic Affairs, Regional Development and Energy]) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** In exceptional cases where the funding has been increased to 60%, the calculated and approved subsidy rate will be checked again during proof-of-use. If the conditions for exceptional support have changed, a deduction in the previously agreed percentage points will be made. |
| ***Level of Support*** | **Medium:** Offers levels of support up to **€15,000**, **€30,000,** and €**80,000** for the respective vouchers. |
| ***Predictability*** | **Predictable:** The structure has remained consistent over time. |
| ***Flexibility*** | **Less flexible:** If circumstances change that affect the conditions that the funding was awarded on, the percentage of the support can be changed. |
| ***Differentiation*** | **Differentiated:** Offers **three different vouchers** that offer different levels of support and focus on difference stages of the innovation process. Allows for increases in the level of funding if specific requirements are met. |
| ***Depth*** | **Deep:** Supports the knowledge creation and knowledge transfer from the research system to firms. |

**Sources of information used in compiling Table 7: Baden-Wurttemburg Ministry of Economics, Labour, and Housing (2020), Bayer Innovativ (2020), Belitz, et al. (2013); Binder Dijker Otte & Co. (2020), Crunchbase (2020), Data One (2020), Ernst & Young (2019), European Commission (2020b, 2020c; 2020d; 2020e), Federal Ministry for Economic Affairs and Energy (2019a; 2019b; 2019c; 2019d; 2019e; 2019f; 2019g), Federal Ministry of Education (2020a; 2020b), German Digital Technologies (2020), Kreditanstalt für Wiederaufbau (2020), Ministry of Economic Affairs, Innovation, Digitalisation and Energy of the State of North Rhine-Westphalia (2020), SME Innovative and Digital (2020), Ministry of Economic Affairs, Innovation, Digitalisation and Energy of the State of North Rhine-Westphalia (2020), The Association of Industrial Research Organisations (2020).**

## Section 3.4 Belgium

There are a number of funding agencies/government bodies responsible for innovation and science policy instruments at the firm level in Belgium, some of which function solely at the regional level in Flanders, the Brussels-Capital Region and Wallonia. These include:

1. Agency for Innovation and Entrepreneurship (VLAIO)

The *Agency for Innovation and Entrepreneurship* (VLAIO) is a governmental organisation of the Flemish regional government. The mission of VLAIO is to stimulate and support innovation and entrepreneurship, and to contribute to a favourable business-climate in Flanders (European Commission, 2020f). The activities of VLAIO include stimulating growth and innovation by financially supporting firms through subsidies; stimulating entrepreneurship by collaborating with different organisations that can guide SMEs with the (pre)start from growth until take-over; supporting clusters; and enhancing environmental factors such as facilitating the development of business areas (European Commission, 2020f). In 2016, Enterprise Flanders and the firm-level activities of Agency for Innovation by Science and Technology (IWT) were merged into VLAIO (OECD, 2018).

2. The Brussels Institute for Research and Innovation (INNOVIRIS)

The *Brussels Institute for Research and Innovation* (INNOVIRIS) is a public agency established in 2004 answering directly to the minister in the Brussels-Capital Region with responsibility for scientific research. Its mission is to support and encourage research, development, and innovation in the Brussels-Capital Region (European Commission, 2020g). This is achieved through funding innovative projects of firms, research organisations and the non-profit sector. The vision of INNOVIRIS is to make the Brussels-Capital Region active, competitive, innovative, and knowledge-driven (European Commission, 2020g). Since 2008, INNOVIRIS has become completely independent of the regional ministry and manages the entire regional budget for research and innovation, as well as its own operating budget (European Commission, 2020g). INNOVIRIS manages various funding measures targeting universities and firms located in the region, including support for technology transfer. Most measures are implemented through a process which includes the following steps: calls for proposal; evaluation and selection of proposals by the expert juries; and, finally, scientific and financial monitoring of the selected projects[4].

3. Flanders Make

*Flanders Make* is a strategic research centre for the manufacturing industry. From sites throughout the Flemish region, *Flanders Make* stimulates open innovation through excellent research (Flanders Make, 2020a). In addition, firms can work together with *Flanders Make* on custom innovation projects. Finally, *Flanders Make* also offers an extensive range of testing and validation infrastructure for firms' products or production (Flanders Make, 2020a). The goal of *Flanders Make* is to contribute to the technological development of the vehicles,

[4] For more information on INNOVIRIS's innovation and science policy instruments, see: https://ec.europa.eu/growth/tools-databases/regional-innovation-monitor/organisation/brussels-institute-research-and-innovation-innoviris

machines, and factories of the future. By doing so, *Flanders Make* seeks to create added value for the manufacturing industry (Chamber of Commerce Luxembourg, 2017). In addition, *Flanders Make* attaches great importance to international cooperation in the field of innovation, and to participation in European research projects (Chamber of Commerce Luxembourg, 2017). *Flanders Make* also engages in joint projects with VLAIO to conduct feasibility studies for firms' potential innovative projects. The results from joint feasibility studies can be used to determine whether the project should receive funding from VLAIO for the continuation of the project (Flanders Make, 2020b).

4. Federal Public Service (FPS) Finance

*Federal Public Service (FPS) Finance* is responsible for ensuring fair and correct taxation policies, as well as the protection of public health, the environment, and the safety of people and goods (European Commission, 2020h). At the firm level, FPS Finance offers tax deductions that support firms carrying out innovation and R&D. These deductions can be offered for a wide range of activities including: firms patenting intellectual property; firms investing in R&D; and employees who introduced new and innovative ideas to the firm (FPS Finance, 2018).

5. Public Service of Wallonia (SPW)

In 2008, *Ministry of the Walloon Region* (MRW) and *Ministry of Equipment and Transport* (MET) merged into a single entity called *Public Service of Wallonia* (SPW). With that merger came a focus on facilitating the exchange of information and harmonising public action (NRB Group, 2020). SPW's objective is to optimise the quality and effectiveness of the services offered to citizens in order to better respond to the new needs of society (NRB Group, 2020). SPW offers grants and loans to firms to help them conduct R&D, and moreover to collaborate with other firms on R&D projects (SPW, 2013).

6. Institut de Microélectronique et Composants (IMEC)

*Institut de Microélectronique et Composants* (Institute of Microelectronics and Components [IMEC]) performs world-leading research in the field of nano-electronics and nano-technology (OECD STIP, 2020b). This research includes digital components, organic electronics, or scaling-driven nano-electronics and is applied in healthcare, smart electronics, sustainable energy and transport (OECD STIP, 2020b). IMEC brings together nearly 3,500 national and international researchers and has a unique infrastructure, with the most advanced equipment for research into next-generation IC technologies, and state-of-the-art bio, network and imaging labs (IMEC, 2016). IMEC collaborates on R&D projects with (typically smaller) firms.

**Table 8: Innovation and science policy instruments available to firms in Belgium (2007-2020)**

| **Policy Instrument / Intervention** | **Research Project grant (First introduced in 2018; Evolved from previous policy instruments)** |
|---|---|
| ***Agency responsible*** | Agency for Innovation & Entrepreneurship (VLAIO) |
| ***Criteria / Eligibility Requirements*** | Available to all firms in the Flemish region. Personnel and other costs related to the knowledge building phase of an innovation process are eligible for funding. Grants of **25% to 60%** of the project budget. Grants should be **at least €100,000 and at most €3 million**, for a maximum duration of three years to implement an individual projects around a specific innovative idea. Open to all sectors, application domains, and knowledge areas. The emphasis within funded research projects is on building up new, ground-breaking knowledge in a firm's domain, which is necessary to eventually develop the idea into new or improved products, processes or services. Firms must also supply a description of the project and the anticipated impact (project description of circa 30 pages, impact description circa 10 pages). |
| ***What is the support for?*** | Expand or strengthen firm-level R&D activities, with an emphasis on research projects **building new knowledge**. |
| ***Funding and Scale*** | In the last 5 years, 63 projects have been supported, across 879 firms, with a total funding level of €59.7 million. |

| **Policy Instrument / Intervention** | **Development Project grant (First introduced in 2018; Evolved from previous policy instruments)** |
|---|---|
| ***Agency responsible*** | Agency for Innovation & Entrepreneurship (VLAIO) |
| ***Criteria / Eligibility Requirements*** | Available to all firms, including SME subsidiaries of foreign-owned multinational enterprises based in Flanders. Furthermore, the enterprise should have the capacity to exploit the result of the funded project in Flanders, and hence create enough economic impact in the form of employment and investments (of which the requested aid is **at least €25,000 and at most €3 million**). Firms must apply with a description of the business case and the project (about 10 pages for a simple project, up to several tens of pages for more complex projects, projects with support amounts above €250,000 or projects with different partners). Maximum duration of 24 months. Grants are usually paid in annual instalments, in the form of advances. |
| ***What is the support for*** | Supports firms with **innovative ideas** – new or improved product, process, or service – that can change and enhance a firm in the short-term. |
| ***Funding and Scale*** | In the last 5 years, 286 projects have been supported, across 3,021 firms, with a total funding level of €68.7 million. |

| **Policy Instrument / Intervention** | **SME Growth Subsidy (First introduced in 2016)** |
|---|---|
| ***Agency responsible*** | Agency for Innovation & Entrepreneurship (VLAIO) |
| ***Criteria / Eligibility Requirements*** | Available to SMEs or individuals practicing a liberal profession (e.g. lawyers, notaries, engineers, architects, doctors, dentists, and accountants) in the Flemish region. Firm must be active in the private sector. Administrative government participation is less than 25%. Firms must: have an acceptable principal activity; have no negative equity on the filing date. Supports SMEs with growth ambitions during growth trajectories through transformation, innovation, and internationalisation. SMEs can receive a maximum of **€50,000** subsidy through the SME growth subsidy per 12-month growth trajectory. The subsidy amounts to a maximum of **€25,000** for advice from one or more external service provider and a maximum of **€25,000** for the recruitment of a strategic employees. The support is set at 50% of the consultancy and/or wage costs. To be eligible for a subsidy, the project amount is at least €20,000. An SME can receive a maximum of one subsidy application per year and per growth trajectory. |
| ***What is the support for*** | The SME Growth Subsidy aims to **stimulate innovation** and growth, and to promote the competitiveness of SMEs in Flanders. |
| ***Funding and Scale*** | In the last 5 years, 1,861 projects have been supported, across 8,304 firms, with a total funding level of €33.9 million. |

**Table 8: Innovation and science policy instruments available to firms in Belgium (2007-2020) (continued [1])**

| Policy Instrument / Intervention | R&D Business projects (First introduced in 1991; Replaced by Development project and Research project grants in 2018) |
|---|---|
| *Agency responsible* | Agency for Innovation & Entrepreneurship (VLAIO) |
| *Criteria / Eligibility Requirements* | Available to all firm in Flanders. Only firms that can demonstrate the project will add value to the economy can submit proposals. If necessary, universities or research institutes can act as a subcontractor (or research partner) in carrying out the research project. The **grant rate varies from 25% - 80%**, depending on type of research. SMEs (defined as firms with less than 250 employees) can receive additional support. The minimum value is **€100,000** and the **maximum value is €3 million**. |
| *What is the support for* | Supports for **R&D projects** carried out by one or more firm(s), which can be in collaboration with research partners. |
| *Funding and Scale* | In the last 5 years, 840 projects have been supported, across 1,022 firms, with a total funding level of €518.1 million. |

| Policy Instrument / Intervention | SME Innovation Project (First introduced in 2001; Replaced by Development project and Research project grants in 2018) |
|---|---|
| *Agency responsible* | Agency for Innovation & Entrepreneurship (VLAIO) |
| *Criteria / Eligibility Requirements* | Available to SMEs in the Flemish region. Maximum project duration of 24 months. A series of selection criteria are considered, including: sufficient substantive challenges; novelty of the idea; contribution to firm knowledge; feasibility of the project within the set time frame and resources deployed; and expertise of the project partners and subcontractors. The minimum budget required for the project is €50,000. Maximum support of €250,000. The subsidy rate differs depending on firm size. **Subsidy rate for small firms is 45%** and of **35% for a medium-sized firm**. Both can be increased by 10% if there is substantial cooperation between firms. Maximum of two innovation projects per firm and per calendar year. An important condition is that the SME innovation projects are aimed at research (and not development). |
| *What is the support for?* | Supports Flemish SMEs with their **innovation projects**. |
| *Funding and Scale* | In the last 5 years, 594 projects have been supported, across 657 firms, with a total funding level of €105.9 million. |

| Policy Instrument / Intervention | Sprint project (First introduced in 2013; Replaced by Development project and Research project grants in 2018) |
|---|---|
| *Agency responsible* | Agency for Innovation & Entrepreneurship (VLAIO) |
| *Criteria / Eligibility Requirements* | Available for large firms (more than 250 employees) carrying out development activities without the capabilities to carry out large-scale R&D projects. The project maximum duration is 24 months. The minimum budget required is €50,000. The **maximum funding** available to firms is **€250,000**. The aid is paid in six-monthly instalments in the form of advances. |
| *What is the support for* | Supports large firms without the capabilities to carry out **large-scale R&D projects**. |
| *Funding and Scale* | Exact funding and scale unavailable. |

| Policy Instrument / Intervention | SME Innovation Feasibility Study (First introduced in 2009; Replaced by Development project and Research project grants in 2018) |
|---|---|
| *Agency responsible* | Agency for Innovation & Entrepreneurship (VLAIO) |
| *Criteria / Eligibility Requirements* | Available to SMEs in the Flemish region. Provides funding for feasibility studies of a limited scope. Offers support up to a maximum rate of 50% and maximum grant amount **of €25,000**. Can be increased to **€50,000** if there is an external knowledge contribution from third parties not related to the applicant. This can be done in the form of cooperation (partners) and outsourcing (subcontracting). |
| *What is the support for* | An SME feasibility study should provide better and well-founded insights about the **possibilities and feasibility of an innovation project**. |
| *Funding and Scale* | In the last 5 years, 211 projects have been supported, across 240 firms, with a total funding level of €8.26 million. |

**Table 8: Innovation and science policy instruments available to firms in Belgium (2007-2020) (continued [2])**

| Policy Instrument / Intervention | Innovation Mandates (First introduced in 2009) |
|---|---|
| ***Agency responsible*** | Agency for Innovation & Entrepreneurship (VLAIO) |
| ***Criteria / Eligibility Requirements*** | Available to all firms located in the Flemish region (firms can have their headquarters outside of the Flemish region). Must be part of a consortium between a Flemish firm, Flemish knowledge institution and postgraduate researcher. The eligible projects focus on the elaboration of basic research to make the results applicable within firms and on the economic valorisation of research. The accepted budget forms the basis for the calculation of the subsidy. The aid depends on the type of mandate and the phase. **Spin-off firms:** receive a 100% subsidy, paid to the knowledge institution. **Existing firm:** 2 phases are possible. **Phase 1:** research phase (maximum duration 12 months): 100% subsidy paid to the knowledge institution. **Phase 2:** follow-up phase, if Phase 1 successful, with firm co-financing, the funding percentage depends on the size of the firm. Large firms can receive a grant rate of 50%. Medium-sized firms can receive a grant rate of 60%. Small firms can receive a grant rate of 70%. Project can receive an additional 10% aid if there is an effective cooperation between several independent firms, where none of the firms is responsible for more than 70% of the costs of the cooperation project, and at least one partner is an SME. |
| ***What is the support for?*** | Allows for postdoctoral researchers to carry out a **project in close collaboration with firms**, either with an existing firm or with a view to setting up a new firm. The main aim of the research project is the **economic valorisation of research** and the further elaboration of basic research to make the results applicable within firms. Focus on projects with a risk level that is too high to be carried out as an ordinary R&D project. |
| ***Funding and Scale*** | In the last 5 years, 49 projects have been supported, across 84 firms, with a total funding level of €5.79 million. |

| Policy Instrument / Intervention | Baekeland Mandate (First introduced in 2009) |
|---|---|
| ***Agency responsible*** | Agency for Innovation & Entrepreneurship (VLAIO) |
| ***Criteria / Eligibility Requirements*** | Available to any consortium consisting of (at minimum) a Flemish firm, a Flemish university, and a Doctoral student. Other types of public knowledge providers can also act as host organisations if they cooperate with an academic promotor affiliated with a Flemish university. To be eligible for support, the project proposal must therefore offer a scientific challenge that allows the researcher to become intellectually skilled and to develop into a fully-fledged researcher. The funding percentage depends on the size of the firm, and equals 50% for a large firm, 60% for a medium-sized firm and 70% for a small firm. The project can get 10% extra support if there is a well-balanced collaboration between several independent firms, of which none of the firms contributes more than 70% of the cost, and at least one partner is an SME. |
| ***What is the support for*** | Supports research that has an economic impact and – if successful – offers added value to the firm involved. Supports carrying out a doctoral project with added value for the firm involved in the project. |
| ***Funding and scale*** | In the last 5 years, 237 projects have been supported, across 809 firms, with a total funding level of €43.2 million. |

| Policy Instrument / Intervention | Innovation Boosting |
|---|---|
| ***Agency responsible*** | Flanders Make and Agency for Innovation & Entrepreneurship (VLAIO) |
| ***Criteria / Eligibility Requirements*** | Available to existing firms and start-ups who seek advice in the development of an innovative idea. Both innovative products and production processes are eligible. Offers extensive feasibility studies. Flanders Make carries out the feasibility study before an assessment is made on whether the project qualifies for VLAIO funding. The maximum budget of an *Innovation Boosting* project is **€60,000**. Depending on the size of the firm, **25 – 45%** of this is subsidised. In concrete terms, this means that the actual level of finance provided for small firms can be limited to 5% of the total project cost, and 15% for medium-sized firms. |
| **What is the support for?** | The *Innovation Boosting* support helps firms to **lower innovation barriers**, through offering detailed feasibility studies, exclusively for Flemish firms. |
| **Funding and scale** | Exact funding and scale unavailable. The maximum amount granted is €60,000. |

**Table 8: Innovation and science policy instruments available to firms in Belgium (2007-2020) (continued [3])**

| Policy Instrument / Intervention | Proof of Business (First introduced in 2018) |
|---|---|
| ***Agency responsible*** | The Brussels Institute for Research and Innovation (INNOVIRIS) |
| ***Criteria / Eligibility Requirements*** | Available to firms with the following characteristics: Firms must develop all or part of their business activities in the Brussels-Capital Region; demonstrates its ability to fund its share of the project expenses; has fulfilled its obligation under previous grants awarded by the Brussels-Capital Region. Funded projects must have the following characteristics: Project is designed to develop a technologically innovative prototype or service, which may have a favourable impact on the economy, employment and/or sustainable development in the Brussels-Capital Region. Eligible firms receive a grant that **covers 50% to 70% of the costs** to obtain a proof of business or proof of concept, regardless of the industry the firm is based in. Firms can have a maximum budget of **€100,000**. The proposed work programme must last at least three months, but not more than nine months. |
| ***What is the support for?*** | The main purpose of this funding programme is to demonstrate that the business component is in line with the development of a **first innovative product/service,** and that the product/service is well integrated into the overall business strategy, with a view to growth and long-term sustainability. |
| ***Funding and Scale*** | Exact funding and scale unavailable. |

| Policy Instrument / Intervention | Proof of Concept |
|---|---|
| ***Agency responsible*** | The Brussels Institute for Research and Innovation (INNOVIRIS) |
| ***Criteria / Eligibility Requirements*** | Available to research organisations with their head office in the Brussels-Capital Region. The project supervisor must be a professor, an accredited researcher of the research organisation, or a research director. Funding duration is 6-15 months. Project **budget must be justified** by research organisation before a **grant is awarded**. |
| ***What is the support for?*** | Supports Brussels-Capital Region research organisations that want to obtain a proof of concept or proof of the socio-economic relevance of **research results for an innovative technology, method or idea**, with a view to commercialisation and/or spin-out firms. |
| ***Funding and Scale*** | Exact funding and scale unavailable. |

| Policy Instrument / Intervention | Feasibility Studies |
|---|---|
| ***Agency responsible*** | The Brussels Institute for Research and Innovation (INNOVIRIS) |
| ***Criteria / Eligibility Requirements*** | Available to all firms that want to check the technical feasibility and possibilities of their innovation. Firms can receive a grant of 50% to 70% of the cost of having a technical feasibility study carried out in-house. Grant rates are administered as follows: **Small firms:** 70%. **Medium firms:** 60%. **Large firms:** 50%. Firm must be active in the Brussels-Capital Region. The R&D project must have a positive impact on the region's economy, employment and/or sustainable development. Firms are expected to cover part of the costs of the project. Firm must have fulfilled obligations from previous Brussels-Capital Region support. The percentage of a firm's contribution depends on the focus of firm's project (industrial research or experimental development). |
| ***What is the support for*** | Supports firms in testing the **technical feasibility and possibilities** of their innovation. |
| ***Funding and scale*** | Exact funding and scale unavailable. |

| Policy Instrument / Intervention | Innovation Vouchers (First introduced in 2012; Formerly known as the *Boost* Programme) |
|---|---|
| ***Agency responsible*** | The Brussels Institute for Research and Innovation (INNOVIRIS) |
| ***Criteria / Eligibility Requirements*** | Available to SMEs in the Brussels-Capital Region. Supports projects for **up to 75%** of eligible costs. Maximum grant amount of **€10,000 per year**. Gives SMEs in Brussels the opportunity to rapidly seek the expertise of a research centre, for a limited amount of time. The aim is to examine an innovative idea or contribute specific expertise to an innovative project. |
| ***What is the support for?*** | Financial support to small and very small enterprises (less than 50 employees) for a one-time **technical research project** in a Brussels research institution. |
| ***Funding and scale*** | Exact funding and scale unavailable. |

**Table 8: Innovation and science policy instruments available to firms in Belgium (2007-2020) (continued [4])**

| Policy Instrument / Intervention | R&D Project (Programme gathers three programmes formerly known as 'Explore', 'Shape' and 'Upgrade') |
|---|---|
| ***Agency responsible*** | The Brussels Institute for Research and Innovation (INNOVIRIS) |
| ***Criteria / Eligibility Requirements*** | Eligibility for this support depends on pre-defined criteria including the firm size, the nature of the project, the form of the aid, the possible existence of a collaboration with a national or European firm, or a research organisation. Finance 15% to 70% of the cost for three funding categories: 1) **Industrial research**: acquiring scientific knowledge to achieve a predetermined industrial or commercial goal. The result of this project leads to the development of a proof of business or a prototype; 2) **Experimental development**: developing an innovative product, process or service, where the firm has already taken some steps to analyse the feasibility of the idea. There are still uncertainties and risks regarding the concrete use of the technology. This project results in a prototype tested in a real environment; 3) **Organisation and process innovation**: Implement a new organisational structure, process or a new method of production or delivery in firm. Have defined the issues with the current and estimated the benefits of proposed innovation. Have tested the innovation on a small scale. For **Industrial research**, the level of contribution as an individual project subsidy is as follows: Small firms – 70%, Medium firms – 60% and Large firms – 50%. These levels may be increased by 15% in the event of effective collaboration, with a level of contribution of maximum 80%. For **Experimental development**, the level of contribution is as follows: Small firms – 45%, Medium firms – 35% and Large firms – 25%. Level of contribution as a recoverable advance is as follows: Small firms – 55%, Medium firms – 45% and Large firms – 35%. These levels of contribution may be increased by 15% in the event of effective collaboration. For **process innovation or organisational innovation**, the level of contribution subsidy is as follows: Small firms – 50%, Medium firms – 50% and Large firms (in effective collaboration with an SME) – 15%. |
| ***What is the support for*** | Offers financial support to develop, complete or implement an **innovative product, process, or service**. |
| ***Funding and scale*** | Exact funding and scale unavailable. |

| Policy Instrument / Intervention | Experimental Platform – Living Labs |
|---|---|
| ***Agency responsible*** | The Brussels Institute for Research and Innovation (INNOVIRIS) |
| ***Criteria / Eligibility Requirements*** | Available to SMEs with an operating office located in the Brussels-Capital Region. Offers a subsidy to cover the costs involved in preparing a *Living Labs* (LL) project. LL operate as intermediaries among cities, regions, firms, third sector and research organisations, as well as citizens, for joint value co-creation, rapid prototyping, or validation to scale up and speed up innovation and firms. Costs covered include: staff costs; operating costs for the organisation of meetings and preparatory workshops with a view to preparing and setting up the project; the cost of legal services carried out in the framework of a service contract; the costs of consultancy services, including the costs of involving a research body and other similar charges involved in preparing a project. The Brussels-Capital Region has a financial intervention rate of 100% and a maximum budget of **€25,000 per platform project**. Grant rates for projects as part of the LLs vary depending on what size of firm applies for the grant. Small firms: receive grants of up to 45%. Medium firms: receive a grant of up to 35%. Large firms: receive grants up to 25%. If the application involves collaboration with one (or more) other research body/bodies, non-trade body or firms, firms can receive an additional 15% support. Up to a maximum of 60%. |
| ***What is the support for*** | Allows participants to experiment together with other stakeholders and to **test innovative solutions** in a real environment. |
| ***Funding and scale*** | Exact funding and scale unavailable. |

| Policy Instrument / Intervention | Institut de Microélectronique et Composants (Institute of Microelectronics and Components; IMEC; First introduced in 1984) |
|---|---|
| ***Agency responsible*** | Interuniversitair Micro-Elektronica Centrum (IMEC) |
| ***Criteria / Eligibility Requirements*** | Available to all firms. IMEC is an independent non-profit research centre. IMEC's revenue is mainly realised by **collaborative R&D with firms**, universities, and research centres worldwide. IMEC receive an annual research grant from the local government (approx. 15% of IMEC revenue) which support IMEC in conducting longer-term research. Firms can collaborate with IMEC on research projects. IMEC does not fund firms. |
| ***What is the support for?*** | Supports research in the field of **nano-electronics and nano-technology**. This research includes digital components, organic electronics, or scaling-driven nano-electronics and is applied in healthcare, smart electronics, sustainable energy, and transport. |
| ***Funding and scale*** | Exact funding scale unavailable. Estimated annual budget of over €500 million. |

**Table 8: Innovation and science policy instruments available to firms in Belgium (2007-2020) (continued [5])**

| Policy Instrument / Intervention | R&D Investment Deduction |
|---|---|
| ***Agency responsible*** | Federal Public Service (FPS) Finance |
| ***Criteria / Eligibility Requirements*** | Available to all firms in any sector that invest in new assets in Belgium that are used to produce high-tech products. It consists of a one-time tax deduction (at **13.5% of R&D expenditure**) or a deferred deduction spread over the amortisation period (at **20.5%**). This is in addition to the regular deduction of the R&D expenses, including acquisition cost of patents and R&D assets (both tangible assets as certain capitalised expenditure such as salary costs). Patent expenses are not eligible for the spread deduction. Excess deductions may be carried forward indefinitely or converted into a tax credit. There is no ceiling. |
| ***What is the support for*** | To stimulate the local economy and encourage production of high-tech products, by awarding an R&D investment deduction to firms **investing in new high-tech assets**. |
| ***Funding and scale*** | Exact funding and scale unavailable. |

| Policy Instrument / Intervention | Innovation Income Deduction (First introduced in 2007; Also known as Belgium Patent Box) |
|---|---|
| ***Agency responsible*** | Federal Public Service (FPS) Finance |
| ***Criteria / Eligibility Requirements*** | All firms who are subject to corporate income tax in Belgium are eligible to apply for the *Innovation Income Deduction*. Allows firms to **deduct 85% of the net income** they derive from certain qualifying intellectual property income from their Belgian corporate tax base. Besides patents that have already been granted, the *Belgian Patent Box* also applies to patent applications as soon as they are filed. The value of a firm's innovation is calculated on that income (the 'innovation-related profit'). This profit is the basis for the *Belgian Patent Box* that is deducted from the taxable profit of the firm. Applying for *Belgian Patent Box* will reduce the tax burden. The profits from these protected innovations will be taxed at 3.75%. |
| ***What is the support for*** | This measure is a stimulus for Belgian firms with an **in-house R&D department**. Corporation tax on profits from a firm's own innovations are reduced by up to 85%. |
| ***Funding and scale*** | €788.282 million, 432 firms in 2017. |

| Policy Instrument / Intervention | Tax Credit on Research and Development (First introduced in 2010) |
|---|---|
| ***Agency responsible*** | Federal Public Service (FPS) Finance |
| ***Criteria / Eligibility Requirements*** | A reduction of the tax payable by **€3.38 per €100 investment** (set off full amount in year of investment) or €5.13 spread over the depreciation period of the asset. These must be investments used for R&D for new products and advanced technologies that are environmentally friendly. |
| ***What is the support for?*** | The **tax credit for R&D** is granted for investments in tangible fixed assets newly acquired or constituted, and in new intangible fixed assets, which are allocated in Belgium to the exercise of the corporate purpose. |
| ***Funding and scale*** | €102.977 million, 598 firms in 2017. |

| Policy Instrument / Intervention | Innovation Premium (First introduced in 2017) |
|---|---|
| ***Agency responsible*** | Federal Public Service (FPS) Finance |
| ***Criteria / Eligibility Requirements*** | Available to all firms in Belgium. For a creative employee who contributes to a new idea (with added value) that is implemented within the firm. The recipient is exempt from personal income tax and social security contributions for the employee and employer. The maximum amount available is one month's gross salary per worker and per calendar year. |
| ***What is the support for?*** | The support rewards employees for contributing creative and innovation ideas which add value to a firm. |
| ***Funding and scale*** | €160.624 million in 2017. |

**Table 8: Innovation and science policy instruments available to firms in Belgium (2007-2020) (continued [6])**

| Policy Instrument / Intervention | Wage Withholding Tax Credit (First introduced in 2006) |
|---|---|
| ***Agency responsible*** | Federal Public Service (FPS) Finance |
| ***Criteria / Eligibility Requirements*** | Available to all firms based in Belgium. The employer is entitled to an 80% exemption of payment of the wage withholding tax of highly qualified researchers. The part of the withholding tax that is deducted but not paid to the tax administration stays at the disposal of the employer. As a result, this mechanism works as a wage subsidy to the employer. The exemption has no impact on the withholding tax credited against the tax to be paid by the income recipient. |
| ***What is the support for?*** | Supports firms by diminishing the wage cost of highly qualified researchers, thus reducing the cost of R&D. |
| ***Funding and scale*** | €722.745 million, 6,024 firms in 2017. |

| Policy Instrument / Intervention | Direct Grants & Loans - R&D Projects (First introduced in 1989) |
|---|---|
| ***Agency responsible*** | Public Service of Wallonia (SPW; Service Public de Wallonie) |
| ***Criteria / Eligibility Requirements*** | Available to any firm from any sector carrying out any industrial research or experimental development project. Firm must have a head office located in Wallonia. This financial aid can be granted in the form of a subsidy or a recoverable advance, which can cover 30% to 70% of the eligible expenditure. The level of support is dependent on whether the project is an R&D project or an Experimental Development project and the size of the firm. **Small firms:** (Individual R&D project) – 70% subsidy; (R&D Project Co-Operation) – 80% subsidy; (Individual Experimental Development) – 55% recoverable advance; (Experimental Development Co-Operation) – 70% recoverable advance or 60% subsidy. **Medium firm:** (Individual R&D Project) – 60% subsidy; (R&D Co-Operation) – 70% Subsidy; (Individual Experimental Development) – 45% recoverable advance; (Experimental Development Co-Operation) – 60% recoverable advance or 50% subsidy. **Large firms:** (Individual R&D Project) – 30% subsidy; (R&D Co-Operation) – 40% subsidy; (R&D Experimental Development) – 35% recoverable advance; (Experimental Development Co-Operation) – 50% recoverable advance or 40% subsidy. |
| ***What is the support for?*** | Direct support for industrial research & experimental development. Support new knowledge acquisition, the development of new products, processes or services and significant improvements of existing products, processes or services. |
| ***Funding and scale*** | Exact funding and scale unavailable. €41 million in grants (research activities), €78 million in repayable advances (development activities) |

**Sources of information used in compiling Table 8: Brussels Institute for Research and Innovation (2020a; 2020b; 2020c), European Commission (2020f; 2020g; 2020h), Federal Public Service Finance (2020a; 2020b), Flanders Agency for Innovation and Entrepreneurship (2018a; 2018b; 2018c; 2018d; 2020a; 2020b; 2020c; 2020d; 2020e), Flanders Make (2020a; 2020b), IMEC (2016), OECD STIP Compass (2020b), OECD (2018), Public Service de Wallonia (2013).**

**Table 9: Design features of innovation and science policy instruments in Belgium (2007-2020)**

| Policy Instrument / Intervention | Research Project grant (VLAIO) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Firms submit reports or provide additional information at predetermined times. On this basis, the Agency will disburse approximately 80% of the aid granted through a number of advances. |
| ***Level of Support*** | **High:** Funding between **€100,000 and €3 million**. |
| ***Predictability*** | **Predictable:** Available since 2018. Developed from a series of VLAIO instruments. The target group remains similar, the subsidy amounts are higher, and the criteria have become stricter. Since 2018, projects with military or dual use can be considered. |
| ***Flexibility*** | **Relatively flexible:** Some changes are allowed. If there are changes that have a significant impact on the achievement of the project objectives, on the implementation of the project or on the anticipated impact of the project results on the firm, firms are obligated to report this at all times. |
| ***Differentiation*** | **Differentiated:** The basic aid rate for a research project is **between 25% and 50%.** The project may consist of a mix of development and research activities. Parts that include research will receive a basic aid rate of 50%, and parts that include development will receive a basic aid rate of 25%. |
| ***Depth*** | **Deep:** The emphasis in research projects is on building new knowledge that will eventually form the basis for new or improved products, processes, or services. |

**Table 9: Design features of innovation and science policy instruments in Belgium (2007-2020) (continued [1])**

| Policy Instrument / Intervention | Development Project grant (VLAIO) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Must carry out reports throughout the duration of the project. Reports consist of financial information and progress/activities carried out. |
| ***Level of Support*** | **High:** Support can range from **€25,000 to €300,000**. |
| ***Predictability*** | **Predictable:** Available since 2018. Development Project grant formed from a series of previous VLAOI instruments. The structure remains similar in terms of the target group. Support can be given under certain conditions to projects with military or dual use since September 2018. |
| ***Flexibility*** | **Relatively flexible:** If there are changes that have a significant impact on the achievement of the project objectives, on the implementation of the project or on the anticipated impact of the project results on the firm, firms have an obligation to report this at all times. |
| ***Differentiation*** | **Differentiated:** Maximum **50% per firm**. 25% basic subsidy. Top-up rates are available at the following levels: Up to 10% for medium sized firms, up to 20% for small firms, up to 10% when independent firms work together. |
| ***Depth*** | **Less deep:** Short-term innovation focused support. Aims to bring innovation-driven ideas to the market. |

| Policy Instrument / Intervention | SME Growth Subsidy (VLAIO) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** To receive funding, firms must submit a report and copies of all invoices to show that the work performed complies with the initially approved application. |
| ***Level of Support*** | **Low:** Maximum amount of funding is **€50,000**, distributed in two instalments of €25,000. |
| ***Predictability*** | **Predictable:** Available since 2016. |
| ***Flexibility*** | **Relatively flexible:** It is possible to submit an extension request for the same growth trajectory of a previously approved application. If an SME has already been awarded a subsidy for the recruitment of a strategic employee, it can extend this subsidy application |
| ***Differentiation*** | **Less differentiated:** Maximum grant and rates apply to **all SMEs**. |
| ***Depth*** | **Relatively deep:** Enables SMEs to acquire the knowledge required during a transformation, innovation or internationalisation process. |

| Policy Instrument / Intervention | R&D Business Project (VLAIO) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Firms must submit reports throughout project. The aid is disbursed in six-monthly instalments, in the form of advances. The first instalment is paid after signing the agreement, and the last after the completion of the project implementation. Must meet conditions outlined in agreement to receive funds. |
| ***Level of Support*** | **High:** The minimum value for support is **€100,000** and the maximum is **€3 million**. |
| ***Predictability*** | **Predictable:** Instrument had been first introduced in 1991. Ceased in 2018. |
| ***Flexibility*** | **Relatively flexible:** An urgent notification must be made in the event of unforeseen and important changes during implementation. |
| ***Differentiation*** | **Differentiated:** The grant rate varies from **25% - 80%**, depending on **type of research**. |
| ***Depth*** | **Relatively deep:** Projects supported could be more knowledge intensive or develop innovations for the market. |

| Policy Instrument / Intervention | SME Innovation project (VLAIO) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Maximum of two innovation projects per firm and per calendar year. |
| ***Level of Support*** | **High:** Maximum support of **€250,000**. |
| ***Predictability*** | **Predictable:** Ceased in 2018. Became part of the Research projects and Development project grants. |
| ***Flexibility*** | **Relatively flexible:** Some changes are allowed during the project. However, funding is dependent on firms properly notifying about any changes |
| ***Differentiation*** | **Differentiated:** The subsidy rate **differs depending on firm size**. Subsidy rate for small firms is 45% and of 35% for a medium-sized firm. Both can be increased by 10% if there is substantial cooperation between firms. |
| ***Depth*** | **Less deep:** Focused on introducing innovation to the market. Does not place emphasis on knowledge. |

**Table 9: Design features of innovation and science policy instruments in Belgium (2007-2020) (continued [2])**

| Policy Instrument / Intervention | Sprint project (VLAIO) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** In addition to the correct implementation of the project, compliance with the reporting obligations and the reporting obligation are basic conditions for payment. |
| ***Level of Support*** | **High:** The maximum funding available to firms is €250,000. |
| ***Predictability*** | **Predictable:** Available since 2013. |
| ***Flexibility*** | **Relatively flexible:** An urgent notification must be made in the event of unforeseen and important changes during implementation. |
| ***Differentiation*** | **Less differentiated:** Aimed at larger firms. All qualifying firms are eligible for the same amount of funding. |
| ***Depth*** | **Relatively deep:** Supports firms carrying out R&D activities. Innovation can be included in those activities. |

| Policy Instrument / Intervention | SME Innovation Feasibility project (VLAIO) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Funding is allocated to the firm in two equal instalments. The first instalment of 50% is allocated at the start of the project. The second is allocated after submitting reports and at the conclusion of the study. |
| ***Level of Support*** | **Low:** Maximum support is **€25,000**. |
| ***Predictability*** | **Relatively predictable:** Instrument was first introduced in 2013. Ceased operating in 2018. |
| ***Flexibility*** | **Relatively flexible:** Regular reports are scheduled as part of the project. A final report consists of a concise report on the activities carried out, performances delivered, results achieved and updated valorisation prospects. A financial report must also be made of the project costs. Firms are obligated to urgently make reports in the event of unforeseen and important changes in the project implementation. |
| ***Differentiation*** | **Less differentiated:** The same funding levels are available to all firms. |
| ***Depth*** | **Relatively deep:** Support firms developing a better understanding about possible innovation activities. |

| Policy Instrument / Intervention | Innovation Mandate (VLAIO) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Two months before the end of phase 1, a report must be made on whether or not the milestones (Phase 1 results) will be achieved and the concrete details of the exploitation agreements. Together with advice from experts, this forms the basis for a new decision by the board of directors to continue funding into Phase 2. |
| ***Level of Support*** | **Low:** Maximum of €40,000 per year. |
| ***Predictability*** | **Relatively predictable:** Available since 2009. Structure has remained consistent. However, firms are not guaranteed to make it through Phase 1 to Phase 2. |
| ***Flexibility*** | **Less flexible:** The progression to Phase 2 is tied to the agreed upon milestones of Phase 1 being delivered. |
| ***Differentiation*** | **Differentiated:** Different support is available based on the type of firm applying. **Spin-off firms:** receive a 100% subsidy, paid to the knowledge institution. **Existing firm:** 2 phases are possible. Phase 1: research phase (max. duration 12 months): 100% subsidy paid to the knowledge institution. Phase 2: follow-up phase, if phase 1 successful, with firm co-financing: 50% basic support paid to the firm responsible for the full reimbursement of the partners. Large firms can receive a grant rate of 50%. Medium-sized firms can receive a grant rate of 60%. Small firms can receive a grant rate of 70%. Project can receive an additional 10% aid if there is an effective cooperation between several independent supported firms, where none of the firms is responsible for more than 70% of the costs of the cooperation project and at least one partner is an SME. |
| ***Depth*** | **Deep:** Aims to commercialise and economically valorise research. Expands further on basic research to make results applicable within firms. |

**Table 9: Design features of innovation and science policy instruments in Belgium (2007-2020) (continued [3])**

| Policy Instrument / Intervention | Baekeland mandate (VLAIO) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** After 2 years at the latest, an interim evaluation will be made, including the correct use of the budget. To this end, reports are made on the results and prospects for later applications. |
| ***Level of Support*** | **Medium:** Support is typically a maximum of **€40,000 each year** for the duration of the four-year project. |
| ***Predictability*** | **Predictable:** Available since 2009. Structure has remained consistent. |
| ***Flexibility*** | **Flexible:** Changes in the implementation within the innovation goal are possible without modification of the agreement. If the candidate wishes to drastically change the innovation goal during the performance of a mandate, they must submit this during the mid-term evaluation. |
| ***Differentiation*** | **Differentiated:** The funding percentage depends on the size of the firm and equals 50% for a large firm, **60% for a medium-sized firm** and **70% for a small firm**. The project can get 10% extra support if there is a well-balanced collaboration between several independent firms of which none of the firms contributes more than 70% of the cost, and at least one partner is an SME. |
| ***Depth*** | **Deep:** Supports the knowledge creation process for the firms with the aim of commercialising ideas. |

| Policy Instrument / Intervention | Innovation Boosting (Flanders Make and VLAIO) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Relatively stringent:** Has assessment to determine whether supporting the firm is viable. Once this is met, firms are able to avail of the support. |
| ***Level of Support*** | **Low:** Approximately **25% - 45%** of project costs covered, for projects up to **€60,000**. |
| ***Predictability*** | **Relatively predictable:** Structure has remained consistent. Firms participating in feasibility study are not guaranteed to later receive VLAIO funding. |
| ***Flexibility*** | **Relatively flexible:** Specifically intended for firms to carry out the feasibility study. |
| ***Differentiation*** | **Differentiated:** Offers grants of between 25% - 50% of the project budget up to €60,000 is subsidised. The ultimate cash-out for small firms can be limited to 5% of the total project cost. The cash-out for medium-sized firms is limited to 15%. |
| ***Depth*** | **Relatively deep:** Supports conducting feasibility studies on projects. |

| Policy Instrument / Intervention | Proof of Business (INNOVIRIS) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** This financial support cannot be combined with the funding programme for feasibility studies, which is also provided by INNOVIRIS. |
| ***Level of Support*** | **Medium:** Firms can receive grants of 50% - 70% on budgets worth **up to €100,000**. |
| ***Predictability*** | **Relatively predictable:** Available since 2018. Structure has remained consistent. |
| ***Flexibility*** | **Less flexible:** Projects have a specific schedule. Must last at least 3 months, and at most 9 months. Projects have a project ceiling of €100,000. |
| ***Differentiation*** | **Less differentiated:** Firms must **justify their budget** (up to €100,000) before they receive the grant. |
| ***Depth*** | **Less deep:** Helps firms receive technical and economic validation of innovative project |

| Policy Instrument / Intervention | Proof of Concept (INNOVIRIS) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Relatively stringent:** INNOVIRIS analyses project's quality and relevance, as well as its impact on the employment, economy, and sustainable development of the Brussels-Capital Region before awarding grant. Once grant has been awarded, researchers have a wide variety of eligible costs. |
| ***Level of Support*** | **High:** Offers to support for **up to 100%** of eligible costs. |
| ***Predictability*** | **Relatively predictable:** Structure has remained consistent. |
| ***Flexibility*** | **Less flexible:** Funding is for a period between 6 and 15 months which may not be prolonged or renewed. |
| ***Differentiation*** | **Less differentiated:** Available to **all firms** who meet eligibility requirements. |
| ***Depth*** | **Deep:** Finances the demonstration of the feasibility and viability of an innovative technology, method or idea with a view to promoting scientific research results obtained previously. |

**Table 9: Design features of innovation and science policy instruments in Belgium (2007-2020) (continued [4])**

| Policy Instrument / Intervention | Feasibility Studies (INNOVIRIS) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Firms must submit reports throughout the project. |
| ***Level of Support*** | **High:** Offers between **50% and 70%** of funding. No stated maximum limit to funding. |
| ***Predictability*** | **Relatively predictable:** Structure has remained consistent. |
| ***Flexibility*** | **Relatively flexible:** There is no specified ceiling to the funding once the costs are justified. |
| ***Differentiation*** | **Differentiated:** Grants awarded **vary depending on firm size**. Small/micro firms can receive up to 70%. Medium-sized firms can receive up to 60%. Larger firms can receive a grant of up to 50% of eligible costs. The percentage of a firm's contribution depends on whether the project is industrial research or experimental development. |
| ***Depth*** | **Relatively deep:** Supports firms carrying out feasibility studies on their innovations. |

| Policy Instrument / Intervention | Innovation Vouchers (INNOVIRIS) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Less stringent:** Wide range of eligible activities: feasibility studies, Proof of Concept, prototyping, validation, certification, IP-related tasks, etc. Does not have to be technologically related. |
| ***Level of Support*** | **Low:** Vouchers support up to **75%** of eligible costs. Maximum grant rate is **€10,000**. |
| ***Predictability*** | **Predictable:** Available since 2012. Structure has remained consistent. |
| ***Flexibility*** | **Flexible:** Once SME has received voucher, it can avail of it at any of the research centres. |
| ***Differentiation*** | **Relatively differentiated:** Specifically **aimed at SMEs** in the Brussels-Capital Region. |
| ***Depth*** | **Relatively deep**: Builds links between SMEs and Research Centres for knowledge transfer. |

| Policy Instrument / Intervention | R&D Project (INNOVIRIS) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Firms must carry out reports throughout the project. |
| ***Level of Support*** | **High:** Offers support worth up to a maximum of **80%**. Exact figures depend on the project budget. |
| ***Predictability*** | **Relatively predictable:** Structure has remained consistent. |
| ***Flexibility*** | **Relatively flexible:** Allows funding to be paid as either a grant or a repayable advance. |
| ***Differentiation*** | **Differentiated:** The grant can be awarded under two different forms: as a grant or as a repayable advance. Different levels of funding can be received depending on which form the support comes in. |
| ***Depth*** | **Relatively deep:** Financial support to develop/complete/implement an innovative product, process, or service. |

| Policy Instrument / Intervention | Experimental Platform – Living Labs (INNOVIRIS) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** An initial instalment is allocated as working capital when the agreements are signed. The subsequent instalments are paid according to a 12-month phasing period. Each payment is made after the submission of a debt security to INNOVIRIS. INNOVIRIS performs interim scientific and financial inspections to ensure that the project is progressing according to the agreed plan. An activity report must be sent to INNOVIRIS twice a year. |
| ***Level of Support*** | **High:** Offers to cover **25% - 60%** of eligible costs for firms. |
| ***Predictability*** | **Relatively predictable:** Structure has remained consistent. |
| ***Flexibility*** | **Relatively flexible:** An activity report must be sent to INNOVIRIS twice a year. This report includes actions undertaken, any difficulties, the results achieved and the progress made in developing the results. |
| ***Differentiation*** | **Differentiated:** Grant rates for projects as part of the living labs **varies depending on firm size**. If the application involves collaboration with one (or several) other research body/bodies, non-trade body, firms can receive an additional 15% support. Up to a maximum of 60%. |
| ***Depth*** | **Relatively deep:** Supports some knowledge transfer to firms. More focused on bringing innovation to the market. |

**Table 9: Design features of innovation and science policy instruments in Belgium (2007-2020) (continued [5])**

| Policy Instrument / Intervention | Institut de Microélectronique et Composants (Institute of Microelectronics and Components; IMEC) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Firms do not receive funding from IMEC for participation in projects. Firms are expected to make contributions towards the research project. |
| ***Level of Support*** | **High:** IMEC has an estimated annual budget of **over €500 million**. |
| ***Predictability*** | **Predictable:** Available since 1984. Structure has changed since then, and different instruments are offered. However, objectives and intentions have remained consistent. |
| ***Flexibility*** | **Relatively flexible:** Flexibility may vary depending on what project firms are collaborating on. |
| ***Differentiation*** | **Relatively differentiated:** Specifics of projects **may vary** between the different projects. |
| ***Depth*** | **Relatively deep:** Collaborates with firms, universities, and research centres. |

| Policy Instrument / Intervention | R&D Investment Deduction (Federal Public Service [FPS] Finance) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Relatively stringent:** Has strict definition of R&D investment. Once this is met, firms can avail of deduction. |
| ***Level of Support*** | **High:** Offers **13.5% and 20%** of a tax deduction on eligible R&D costs. There is no ceiling on the amount. |
| ***Predictability*** | **Relatively predictable:** Structure has remained consistent. |
| ***Flexibility*** | **Relatively flexible:** Offers firms the chance to claim the deduction as a one-time tax deduction or as a deferred deduction. However, once firms make their choice, they cannot change their decision. |
| ***Differentiation*** | **Differentiated:** Offers two rates to firms. It consists of a **one-time tax deduction** (at 13.5% of R&D expenditure) or a **deferred deduction spread** over the amortisation period (at 20.5%) |
| ***Depth*** | **Relatively deep:** Supports firms carrying out R&D. |

| Policy Instrument / Intervention | Innovation Income Deduction (Also known as Belgium Patent Box; Federal Public Service [FPS] Finance) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** A 'tracking system' is put in place, so potential recipients can monitor their expenses, income, and Intellectual Property (IP). This is to ensure that only eligible costs are considered. |
| ***Level of Support*** | **High:** Offers firms a tax deduction worth up to **85% of qualifying costs**. Reduces the amount of tax firms must pay on their innovative products. Can reduce corporate tax from 25% to 3.75%. |
| ***Predictability*** | **Predictable:** Available since 2007. The *Innovation Income Deduction* (IID) replaced the Patent Income Deduction (PID) in 2017. |
| ***Flexibility*** | **Flexible:** Once the requirements for R&D are met, firms can apply for tax deduction on any innovation product. |
| ***Differentiation*** | **Less differentiated:** As long as firms meet the eligibility requirements and comply with the stringency measures, they can **avail of the deduction**. |
| ***Depth*** | **Relatively deep:** Specifically rewards and supports innovative firms for creating intellectual property. |

| Policy Instrument / Intervention | Tax Credit on Research and Development (Federal Public Service [FPS] Finance) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Relatively stringent:** Must meet the strict requirements for firms of what they invest in to avail of credit. |
| ***Level of Support*** | **Low:** Firms can avail of a reduction of the tax payable by **€3.38 per €100 investment** (set off full amount in year of investment) or €5.13 spread over the depreciation period of the asset. |
| ***Predictability*** | **Predictable:** Available since 2010. Structure has remained consistent. |
| ***Flexibility*** | **Relatively flexible:** As long as the firm meets the requirements, it can avail of tax credit. The firm can avail of the credit at the end of the year or spread it out over the depreciation period. |
| ***Differentiation*** | **Less differentiated:** Once firms **meet strict requirements**, they can avail of the tax credit. |
| ***Depth*** | **Relatively deep:** Supports firms investing in R&D for new products and technology that is environmentally friendly. |

**Table 9: Design features of innovation and science policy instruments in Belgium (2007-2020) (continued [6])**

| Policy Instrument / Intervention | Innovation Premium (Federal Public Service [FPS] Finance) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Only available for one employee per firm a year. |
| ***Level of Support*** | **Low:** Employee is **exempt from personal income tax**. |
| ***Predictability*** | **Predictable:** Available since 2017. Exact funding is dependent on the employees' wages. |
| ***Flexibility*** | **Flexible:** Wide definition of what counts as an innovative idea. Reward is consistent. |
| ***Differentiation*** | **Less differentiated:** Programme is the **same for all recipients**. |
| ***Depth*** | **Low depth:** Rewards contributions to innovation process, but at a small scale and only available for one month. |

| Policy Instrument / Intervention | Wage Withholding Tax Credit (Federal Public Service [FPS] Finance) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Less stringent:** Once the employee meets the definition of highly qualified researcher, the part of the withholding tax that is deducted but not paid to the tax administration stays at the disposal of the employer. |
| ***Level of Support*** | **Medium:** Firms can claim an exemption of **80%** on employees' wages. |
| ***Predictability*** | **Predictable:** Available since 2006. Consistent in structure. |
| ***Flexibility*** | **Relatively flexible:** Firms are able to apply the credit to any highly qualified researchers. |
| ***Differentiation*** | **Less differentiated:** Once the **employee qualifies as a highly qualified researcher**, firms can avail of the scheme. |
| ***Depth*** | **Low depth:** Covers the cost of highly qualified researchers' wages. |

| Policy Instrument / Intervention | Direct Grants (Public Service of Wallonia [SPW]; Service Public de Wallonie) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Firms must qualify for the respective project type. |
| ***Level of Support*** | **High:** Offers grants and recoverable advance worth between **40% and 70%** of eligible costs. |
| ***Predictability*** | **Predictable:** Available since 1989. Structure has remained consistent. |
| ***Flexibility*** | **Relatively flexible:** Allows firms to request support for Experimental Development projects as either a subsidy or recoverable advance. |
| ***Differentiation*** | **Differentiated:** The level of support is dependent on whether the project is an **R&D project or Experimental Development project** and the firm size. Firms collaborating can receive a Repayable Advance or Grant. |
| ***Depth*** | **Deep:** Supports projects that have the potential to involve acquiring new knowledge. |

**Sources of information used in compiling Table 9: Brussels Institute for Research and Innovation (2020a; 2020b; 2020c), European Commission (2020f; 2020g; 2020h), Federal Public Service Finance (2020a; 2020b), Flanders Agency for Innovation and Entrepreneurship (2018a; 2018b; 2018c; 2018d; 2020a; 2020b; 2020c; 2020d; 2020e), Flanders Make (2020a; 2020b), IMEC (2016), OECD STIP Compass (2020b), OECD (2018), Public Service de Wallonia (2013).**

## Section 3.5 Denmark

There are six key funding agencies/government bodies responsible for innovation and science policy instruments at the firm level in Denmark, as outlined below:

1. Innovation Fund Denmark (IFD)

*Innovation Fund Denmark* (IFD) was established in April 2014. IFD was formed out of the merger between three previous national funding bodies: Danish Council for Strategic Research; Danish Council for Technology and Innovation; and Danish National Advanced Technology Foundation (OECD STIP, 2020c). IFD's main objective is to create a single entry point to innovation funding for Danish firms, universities, and talents (IFD, 2018). IFD offers a variety of programmes to enable firm-level innovation, designed for different target groups and to support different firm needs (IFD, 2018). There are important differences in scope, funding and requirements across the programmes offered. In 2015, the Innovation Fund had a total funding of almost DKK 1.6 billion (€215 million) (Larosse, 2017), which was allocated to firms through a variety of different funding instruments (full details provided in Table 10).

2. Independent Research Fund Denmark (IRDF)

*Independent Research Fund Denmark* (IRDF) funds specific research activities based on researchers' own initiatives (IRDF, 2020). IRDF provides advice in all scientific areas for the Danish Minister for Higher Education and Science, the Danish Parliament, and the Danish Government (IRDF, 2020a). The primary aim of IRDF is to support and promote the most original ideas and initiatives within Danish research (IRDF, 2020a). On annual basis, IRDF awards 400 grants to research projects. In total, and on a per annum basis, the grants amount to over DKK 1 billion (€134.4 million) (UFM, 2020). The grants are allocated via open calls without thematic limitations. IRDF supports specific time-limited research activities and scientific quality is the most important assessment criteria when distributing the funds (IRDF, 2020a). The fund constantly works to ensure the best conditions for free curiosity-driven research in Denmark (UFM, 2020). Firms can collaborate on projects with research institutions. Through this collaboration, firms can gain knowledge and insight into issues of interest to them (IRDF, 2018).

3. Ministry of Industry, Business and Financial Affairs (MIBF)

The *Ministry of Industry, Business and Financial Affairs* (MIBF) seeks to improve the conditions for business in Denmark (MIBF, 2020). As highlighted in MIBF (2020), a key aim of the Ministry is to conduct thorough economic analyses and suggest policy initiatives in areas imperative to economic growth. MIBF is responsible for several policy areas which are important for the general business environment, including business regulation, intellectual property rights, competition and consumer policy, the financial sector and shipping[5]. The main mission of MIBF is to create competitive and innovative conditions which lead to growth (MIBF, 2020). To achieve this, MIBF offers services that allow firms to further develop their capabilities and help generate solutions to problems they face. Particular focus has been placed on firms' digital products and services.

[5] For more information on the work of the Ministry of Industry, Business and Financial Affairs MIBF, see https://eng.em.dk/about-us/

4. Ministry of Taxation (Skatteministeriet)

The *Ministry of Taxation* helps to provide the foundation for financing of the public sector in Denmark (Skatteministeriet, 2020). Each year, the *Danish Customs and Tax Administration* collects close to DKK 1,000 billion (circa €134 billion) for financing of the public sector (Told Styrelsen, 2020). The Ministry offers an R&D Tax Incentive Scheme and the Accelerated Capital Amortisation scheme to encourage R&D in firms (European Commission, 2014).

5. Danish Agency for Science, Technology and Innovation (DASTI)

The *Danish Agency for Science, Technology and Innovation* (DASTI) is an agency under the Danish Ministry of Higher Education and Science. The Agency performs tasks relating to research and innovation policy and provides secretariat services as well as supervising the scientific research councils (European Commission, 2020i). These councils use this information when allocating funds for independent research, strategic research, and for innovation, and providing advice to the political system (European Commission, 2020i). DASTI runs the Innovation Incubator Programme, which helps early-stage, innovative firms in Denmark (UFM, 2015). Essentially, DASTI works with firms at the lowest point of the firm's value chain, where venture capitalists and other private investors are usually reluctant to engage (UFM, 2015). DASTI also offers Innovation Vouchers to help firms develop relationships with research institutions (European Commission, 2019b).

6. Danish National Research Foundation (DNRF)

The *Danish National Research Foundation* (DNRF) is an independent organisation established in 1991 with the objective to promote and stimulate basic research at the highest international level at the frontiers of all scientific fields (European Commission, 2020j). The 'Centre of Excellence' programme is DNRF's main funding mechanism, but a number of other programmes and initiatives have also been launched (European Commission, 2020j). The latter have been specifically targeted at increasing the level of internationalisation of Danish research communities. DNRF has supported Danish research with more than DKK 6.2 billion (circa €830 million) over the period 1993 – 2012 (Ministry of Science, Innovation and Higher Education, 2013). Firms can spinoff from research produced in the Centres of Excellence.

**Table 10: Innovation and science policy instruments available to firms in Denmark (2007-2020)**

| Policy Instrument / Intervention | Innobooster (First introduced in 2014; Previously called The Entrepreneurial Pilot Programme) |
|---|---|
| ***Agency responsible*** | Innovation Fund Denmark (IFD) |
| ***Criteria / Eligibility Requirements*** | Available to SMEs and entrepreneurs and start-ups. SMEs must have a turnover of at least DKK 2 million (circa €268,000) during the past financial year or have attracted external capital of at least DKK 500,000 (circa €67,000). Entrepreneurs and start-ups (under three years old) must have a strong team to implement the project and already have promising results to build on. Firms can apply for between DKK 50,000 – DKK 5 million (circa €6,717 - €671,700). Higher funding amounts necessitate more stringent funding requirements. Projects can last for up to two years. Requirements for firms include: **Novelty value** – The firm must initiate new development activities, and the result of the project must be distinctly different from what is currently on the market; **Value creation and business potential** – The firm must render it probable that it can gain a significant competitive advantage, and in the long term a profit from the solution; **Implementation** – It must be clear which specific activities will be carried out in the project, which concrete results the firm will have after the project, and how they will be used. In addition, the firm must have a team with the right skills, as well as the necessary financial resources to successfully finalise the project; **Financial efficiency** – The project must be budgeted realistically and the desired grant must measure up to the expected business gain and the project risk. |
| ***What is the support for?*** | *Innobooster* is a grant to **develop and make a new product or service ready for the market** or to improve a process that increases the firm's competitiveness and creates growth. The grant may help reduce the firm's project-related risks. |
| ***Funding and Scale*** | DKK 580 million (€78 million) (2014 – 2017) |

| Policy Instrument / Intervention | Grand Solutions (First introduced in 2015) |
|---|---|
| ***Agency responsible*** | Innovation Fund Denmark (IFD) |
| ***Criteria / Eligibility Requirements*** | Available to any legal entity (firms, research institutions or public institutions) in or outside Denmark, directly involved in the project activities. The purpose of *Grand Solutions* (GS) is to invest in high quality research and innovation projects with the potential to create knowledge, growth, and employment in Denmark. Typically grants range from between DKK 5 million and DKK 30 million (circa €671,000 – €4 million). One of the Danish project participants must act as the applicant organisation. Applications for GS projects are assessed based on the following four main criteria: *Excellence* – Quality of research and innovation; *Value creation*; *Efficiency of project execution; Implementation of results.* IFD will cover a maximum of 75% of the project's total costs. The level of support depends on the organisation type, research type, and costs. For firms, 0% of Overheads are covered. **SMEs:** Industrial Research – 75%, Experimental Development – 50%. **Large firms:** Industrial Research – 65%, Experimental Development – 40%. **SMEs (*de minimis* aid):** Industrial Research – 60%, Experimental Development – 35%. **Large firms (*de minimis* aid):** Industrial research – 50%, Experimental Design – 25%. **Organisations carrying out non-economic activities in the project:** Industrial Research 90%, Experimental Development 90%. Public Institutions carrying out non-economic activities. **Danish public research institutions** (including universities, university colleges and sector research institutes)**:** Industrial Research – 90%, Experimental Development – 90%, Overheads – 44%. **Non-Danish public universities** (including universities in Greenland and on the Faroe Islands)**:** Industrial Research – 90%, Experimental Development – 90%, Overheads – 20%. **Public hospitals in Denmark, in Greenland and on the Faroe Islands and state- accredited Danish museums** (under the Museum Act) and national museums in Greenland and on the Faroe Islands**:** Industrial Research – 90%, Experimental Development – 90%, Overheads – 3.1%. **All other Danish and non-Danish public entities**: Industrial Research – 90%, Experimental Development – 90%, Overheads – 0%. **Public institutions, which carry out economic activities in the project:** Same rates as firms. |
| ***What is the support for?*** | The GS support is aimed at **collaborative projects based on excellent research,** focused on solutions of considerable societal value, and cross-disciplinary investments in research institutions and firms. |
| ***Funding and Scale*** | DKK 1.344 billion (circa €180.6 million) given to 67 projects in 2015. |

**Table 10: Innovation and science policy instruments available to firms in Denmark (2007-2020) (continued [1])**

| Policy Instrument / Intervention | Innofounder (First introduced in 2014) |
|---|---|
| ***Agency responsible*** | Innovation Fund Denmark (IFD) |
| ***Criteria / Eligibility Requirements*** | Available to any field of expertise as long as the idea is innovative, and the funding recipient has potential to develop a sustainable firm. *Innofounder* has two tracks: ***Innofounder Graduate*** is relevant for recent graduates from a higher education. ***Innofounder Experienced*** is relevant for individuals who have significant research or work experience. Projects last approximately 12 months. For both tracks, applicants can apply individually or as a team of up to three founders. *Innofounder* finances the establishment and development of the firm in its early phases. The business idea must be in the early phases with extensive development remaining before the product, service or technology is complete and the business model in place. However, preliminary test sales may have taken place. It further entails that no major external funding has been obtained for the business idea and the forthcoming development. ***Innofounder Graduate*** offers: Monthly funding of DKK 15,000 (circa €2,000) per *Innofounder* in the team. Special funding of DKK 50,000 (circa €6,717) to support the development of firm's idea. The special funding follows the individual *Innofounder*. This means that if the *Innofounder* is part of a team of three *Innofounders,* the team will have a total of 3 x DKK 50,000 (circa €6,717), corresponding to three individual programme funding combined. ***Innofounder Experienced*** offers: Monthly funding of DKK 30,000 (circa €4,000). Special funding of DKK 100,000 (circa €13,400) to support the development of the firm's idea. The special funding follows the individual *InnoFounder*. Individuals cannot be admitted to *Innofounder (Graduate and Experienced* respectively) more than once with the same innovative business idea. However, individuals can be admitted more than once with different innovative business ideas. |
| ***What is the support for?*** | *Innofounder* aims to **accelerate the development of innovative business ideas** from early stages to the stage where firms are ready to go to market or gain investment. |
| ***Funding and Scale*** | During the last 5 years this support has been allocated to 114 firms, with a total of DKK 95.77 million (€12.85 million) across 9 rounds of application. |

| Policy Instrument / Intervention | Industrial Researcher Programme (First introduced in 1971; Administered by Innovation Fund Denmark [IFD] since 2014) |
|---|---|
| ***Agency responsible*** | Innovation Fund Denmark (IFD) |
| ***Criteria / Eligibility Requirements*** | Available to all research projects within all research fields, provided the research project is of a high quality and is commercially relevant to the firm. Co-financing the firm's expenses for the candidate's salary and travel activities, as well as the research institution's expenses for the project. **All areas (private sector):** Up to DKK 22,000 (circa €2,955) per month to the Industrial Postdoctoral researcher candidate's salary and up to DKK 2,500 (circa €335) for the firm's expenses for the candidate's travel activities. Up to DKK 10,000 (circa €1,343) per month to cover the research institution's project relevant expenses. Firms may apply without a candidate. If the project is approved, firms must find a candidate within six months after the conditional approval. **Greenland and Faroes Islands:** Up to DKK 17,000 (circa €2,283) per month to the Industrial PhD student's salary. Up to DKK 100,000 (circa €13,400) per annum for the firm's expenses for the student's travel activities, and participation in courses. Fix amount of DKK 360,000 (circa €48,365) per annum, including overhead, for the university. **Research in dementia:** Up to DKK 17,000 (circa €2,283) per month to the Industrial PhD student's salary. Up to DKK 100,000 (circa €13,400) per annum for the firm's expenses for the student's travel activities and participation in courses. Fix amount of DKK 360,000 (circa €48,365) per annum, including overhead, for the university. |
| ***What is the support for?*** | The *Industrial Researcher Programme* invests in Industrial PhD and Postdoctoral researchers' projects. In both project types the candidate is employed in a private firm and enrolled at or **collaborates with a public sector research organisation**. The candidate works on the same project at both organisations. |
| ***Funding and Scale*** | Exact funding and scale unavailable. DKK 160 million (circa €21.5 million) budget in 2018. 112 Industrial PhDs and 28 Industrial Post-Doctoral granted in 2017. |

**Table 10: Innovation and science policy instruments available to firms in Denmark (2007-2020) (continued [2])**

| Policy Instrument / Intervention | Innovation Pilot in Rural Districts (First introduced in 2016) |
|---|---|
| ***Agency responsible*** | Innovation Fund Denmark (IFD) |
| ***Criteria / Eligibility Requirements*** | Available to SMEs with less than 250 employees and an annual turnover of up to DKK 372 million (€50 million), or annual total balance of up to DKK 320 million (€43 million). Eligible SMEs must also have an address in a rural area and meet *Innovation Fund Denmark's* access criteria to be eligible for funding. Projects can address the development of new products, new markets, services, or new production methods. It is essential that the project has considerable business potential and can lead to new opportunities for the firm. Innovation Fund Denmark invests **DKK 150,000 (circa €20,150)** in one-year projects, and **DKK 300,000 (circa €40,300)** in two-year projects, with DKK 150,000 (circa €20,150) each year. |
| ***What is the support for?*** | Firms in rural districts, who have a good idea for a **development or innovation project**, can apply for funds to hire a higher education graduate. |
| ***Funding and Scale*** | In the past 5 years, 245 projects have been funded, with a total amount approved of DKK 53.25 million (circa €7 million). Not all approved funding was paid out as of 2020. |

| Policy Instrument / Intervention | Innoexplorer (First introduced in 2019) |
|---|---|
| ***Agency responsible*** | Innovation Fund Denmark (IFD) |
| ***Criteria / Eligibility Requirements*** | Available to any researcher or research teams that are employed at a Danish public hospital or a public research and educational institution. Funding recipient(s) must conduct research in connection with their employment, which has the potential to produce results or new knowledge that may be used commercially or in society. Funding recipient(s) must not have an established firm based on the knowledge or the result that form the basis for the project. In addition, funding recipients(s) may not establish such a firm for the duration of the project. Researchers may apply for between **DKK 500,000 (circa €67,200) and DKK 1,500,000 (circa €201,000)** for the project. Projects may last up to 12 months. IFD pays the grant to the institution where the researcher is employed. The institution will pay out the grant to the researcher and their project. The institution must be involved in the application process and verify that the project has the potential to produce high quality knowledge with great potential. |
| ***What is the support for?*** | Supports researchers at public research and educational institution or hospitals that created research results with commercial or societal potential. Supports research needing clarification **before it is ready for the market**. |
| ***Funding and Scale*** | In the past 5 years, funding of DKK 74 million (circa €2.2 million) has been allocated across 53 projects from public universities and public hospitals. |

| Policy Instrument / Intervention | Independent Research Fund Denmark (First introduced in 2004; Replaced the Danish Council of Independent Research in 2017) |
|---|---|
| ***Agency responsible*** | Independent Research Fund Denmark (IRFD) |
| ***Criteria / Eligibility Requirements*** | Availability varies depending on the project. Grant funding also depends on the project. **Average size of DKK 3.2 million (circa €430,000)** per grant in 2019. Primary aim of IRFD is to support and promote the most original ideas and initiatives within Danish research. Firms are not supported directly. Firms can collaborate on projects. |
| ***What is the support for?*** | Independent Research Fund Denmark funds specific **research activities within all scientific areas** that are based on the researchers' own initiatives. Research should improve the quality and internationalisation of Danish research. Firms can collaborate with researchers. |
| ***Funding and Scale*** | DKK 15 billion (€2 billion) (2004 – 2014). DKK 1.233 billion (circa €165.6 million), 391 projects in 2019. |

| Policy Instrument / Intervention | SME Digital (First introduced in 2018) |
|---|---|
| ***Agency responsible*** | Ministry of Industry, Business and Financial Affairs (MIBF) |
| ***Criteria / Eligibility Requirements*** | Available to SMEs in Denmark. A grant of **DKK 100,000 (circa €13,400)** is available for firms who believe that digitisation can help them meet a challenge or seize an opportunity and improve their firm, but who need a private consultant to get started or implement their digital project. Firms must have between 3-249 employees, and a turnover of maximum DKK 372 million (€50 million), and/or a balance of a maximum of DKK 320 million (€43 million). The grant allows firms to purchase exactly what they need and reap the benefits of digital investment. As the subsidy is granted under the *de minimis* regulation, the beneficiary must not receive state aid in excess of DKK 1.5 million (circa €200,000), in the current and the two previous financial years. |
| ***What is the support for?*** | The aim of this policy instrument is to help with the **implementation of digital solutions** and to provide guidance on e-commerce and e-exports. |
| ***Funding and Scale*** | Exact funding and scale unavailable. |

**Table 10: Innovation and science policy instruments available to firms in Denmark (2007-2020) (continued [3])**

| Policy Instrument / Intervention | Digital Hub Denmark (First introduced in 2018) |
|---|---|
| ***Agency responsible*** | Ministry for Industry, Business and Financial Affairs (MIBF) |
| ***Criteria / Eligibility Requirements*** | Available to all firms. The initiative is targeted towards firms willing to invest in their skillset within data and Artificial Intelligence (AI). The aim is to make them digital frontrunners within their industry. *Digital Hub Denmark* can contribute with **up to 50%** of the total allocated resources, **up to DKK 250,000** (circa €33,500). In some cases, this could **potentially increase to DKK 500,000** (circa €67,000)). *Digital Hub Denmark* can also facilitate collaboration with external teams of experts within data and AI who can assist during the trial project. The firm must contribute a minimum of 50% of the total allocated resources in the project. |
| ***What is the support for?*** | A platform aiming at developing public-private collaboration models. It helps bringing together private firms, researchers, tech-entrepreneurs, and students to foster the development of new digital products. |
| ***Funding and Scale*** | Exact funding and scale unavailable. DKK 110 million (circa €14.77 million) allocated (2018 – 2022) |

| Policy Instrument / Intervention | The Danish Growth Fund (Vækstfonden; First introduced in 1992) |
|---|---|
| ***Agency responsible*** | Ministry of Industry, Business and Financial Affairs (MIBF) |
| ***Criteria / Eligibility Requirements*** | Available to SMEs and start-up firms in Denmark. The Fund invests in private funds which then invest capital in established firms and start-ups that have significant growth potential, yet have trouble raising sufficient venture capital. Innovation, societal returns, and accountability are the criteria that are looked for when evaluating projects. The **Growth Guarantee (Vækstkaution)** facilitates firms' access to financing in the bank if they need a loan of less than DKK 2 million (circa €268,000). The guarantee covers up to 75% of the bank's risk. Another type of **Growth Guarantee** helps to cover the risk if the firm cannot provide enough collateral to obtain a construction or payment guarantee or to obtain a leasing agreement. The growth guarantee must be at minimum DKK 1 million (circa €134,000), either alone or in combination with a Growth Loan, and it covers 100% of the risk. **Growth loans for entrepreneurs** is targeted at young firms whose short history or lack of collateral means that the bank cannot lift the entire financing. The loan must be a minimum of DKK 1 million (circa €134,000), and the firm must have turnover and a customer base. |
| ***What is the support for?*** | Fosters investment supporting the growth of economically viable SMEs without sufficient access to financing, which hampers **innovation and growth**. |
| ***Funding and scale*** | DKK 27.3 billion (circa €3.7 billion), 8,500 firms (1992 – 2019) |

| Policy Instrument / Intervention | R&D Tax Allowance (Skattekreditordningen; First introduced in 2012) |
|---|---|
| ***Agency responsible*** | Ministry of Taxation |
| ***Criteria / Eligibility Requirements*** | Available to both firms and self-employed. To be eligible, **the applying entity must be loss-making**. The benefit applies to the part of the **losses that can be attributed to R&D activities**. If the firm is part of a group, the consolidated taxable income must also be negative. During the years 2012, 2013 and 2014 a firm could apply for 25% tax credit, set against the deficit it had occurred from R&D expenses. In 2015 the rate was 23.5% and in 2016 it was **22%**. The maximum R&D expenses for a firm in 2012 and 2013 were DKK 5 million (circa €671,000) and the maximum deduction was DKK 1.25 million (circa €167,000) a year. In 2014, the ceiling was raised to **DKK 25 million** (circa €3.36 million). |
| ***What is the support for?*** | To increase private **firms' investment in R&D**. |
| ***Funding and scale*** | DKK 300 million (circa €40.3 million), 600 applications (2012) |

| Policy Instrument / Intervention | Accelerated Capital Amortisation (First introduced in 1973) |
|---|---|
| ***Agency responsible*** | Ministry of Taxation |
| ***Criteria / Eligibility Requirements*** | Available to all firms in Denmark. The purchase of machinery equipment and ships acquired for R&D purposes may be deducted in full in the year of acquisition. A **full deduction** in the year of acquisition generally is available for patents and know-how, irrespective of the economic life or the amount of purchase price. A special tax credit is available for R&D activities that enables firms to obtain a cash refund of tax losses relating to R&D activities **up to DKK 1.25 million (circa €167,000)**. |
| ***What is the support for?*** | Allows firms to **deduct their R&D expenses** for R&D Capital related purchases in the same year as it occurred. |
| ***Funding and scale*** | Exact funding and scale unavailable. |

**Table 10: Innovation and science policy instruments available to firms in Denmark (2007-2020) (continued [4])**

| Policy Instrument / Intervention | Innovation Vouchers |
|---|---|
| ***Agency responsible*** | Danish Agency for Science, Technology, and Innovation (DASTI) |
| ***Criteria / Eligibility Requirements*** | Available to SMEs in Denmark that have existed for at least a year. SMEs must have less than 12 employees and no previous formal interaction with universities or research organisations. The scheme is open for projects within all scientific fields. The administrative structure of the scheme is designed in a manner to reduce bureaucratic measures as much as possible for the project participants. The voucher provides access to scientific knowledge and/or equipment. The **maximum value of the voucher** is **DKK 100,000 (circa €13,400)** and requires 50% co-financing. Co-funding is channelled directly from the Danish Agency of Science, Technology and Innovation to the project's research or technological partners, relieving the SME from having to invoice its project partner. |
| ***What is the support for?*** | **Increase R&D and innovation** capabilities of SMEs by fostering collaboration with public research institutions, **improving knowledge transfer** and by strengthening quality and relevance of public R&D. |
| ***Funding and scale*** | Exact funding and scale unavailable. The maximum value of the voucher is DKK 100,000 (circa €13,400). |

| Policy Instrument / Intervention | The Innovation Incubator Programme (Innovationsmiljøer; First introduced in 1998) |
|---|---|
| ***Agency responsible*** | Danish Agency for Science, Technology, and Innovation (DASTI) |
| ***Criteria / Eligibility Requirements*** | Available to all early-stage innovative firms in Denmark. Four incubators provide professional counselling, pre-seed and seed capital for entrepreneurs and new innovative firms. The incubators can engage financially with firms in three successive stages. **1) Pre-investigation:** A preliminary analysis and evaluation of the technological perspectives and commercial potential of the project (due diligence). On average an amount of **DKK 80,000 (circa €10,748)** can be allocated for this stage. **2) Primary project funding:** Pre-seed funding for the initial capital injection and early stage development activities in the start-up. On behalf of the government the incubator in this stage can invest a maximum of **DKK 3.5 million (circa €470,000)** in the form of loans or equity, provided that a supplementary private investment is raised equalling 18% or more of the total primary investment. **3) Secondary project funding:** Seed funding for further development activities. On behalf of the government the incubator in this stage can invest a maximum of **DKK 2.5 million (circa €335,800)** in the form of loans or equity, provided that a supplementary private investment is raised equalling 60 or more percent of the total secondary investment. |
| ***What is the support for?*** | Provides professional support for early stage, **highly innovative start-ups**. Operates at the earliest stage of the investment chain, where venture capitalists and other private investors are reluctant to engage. |
| ***Funding and scale*** | Approximately DKK1.75 billion (circa €250 million), 1,000 firms (1998 – 2014). |

| Policy Instrument / Intervention | Centres of Excellence (First introduced in 1993/1994) |
|---|---|
| ***Agency responsible*** | Danish National Research Foundation (DNRF). |
| ***Criteria / Eligibility Requirements*** | Available to all research institutions. *Centres of Excellence* may differ in size and mode of organisation, depending on their subject and scope. *Centres* can be established within and across all scientific fields, and traditionally carry out basic research More recently, *Centres of Excellence* have also engaged in applied research, as well as basic research. *Centres* are expected to engage in researching some of the large unsolved questions and address the challenges that intrigue them the most. The philosophy is that when excellent people work with problems they are most passionate about, ground-breaking results will follow. In other words, the foundation welcomes curiosity-driven research. Firms are able to spinoff from this research. Commercialisation statistics for Danish research in 2007-2012 showed that approximately 15% of all spin-off firms and approximately 15% of all patent applications submitted from a public research institution came from a DNRF *Centre of Excellence* programme. |
| ***What is the support for?*** | To strengthen Danish research by providing the best possible working conditions and organisational set-up for selected top researchers. |
| ***Funding and scale*** | DKK 5.4 billion (circa €725.8 million), 88 Centres (1993 – 2012). |

**Sources of information used in compiling Table 10: European Commission (2020i; 2020j), EuroScientist (2014), Greve (2018), Innovation Fund Denmark (2018; 2020a; 2020b; 2020c; 2020d; 2020e; 2020f; 2020g; 2020h), Independent Research Fund Denmark (2018; 2020a; 2020b), Knudsen et al (2018), Ministry of Higher Education and Science (2015; 2020), Ministry of Science, Innovation and Higher Education (2013), OECD STIP Compass (2020c; 2020d), OECD (2019).**

**Table 11: Design features of innovation and science policy instruments in Denmark (2007-2020)**

| Policy Instrument / Intervention | InnoBooster (Innovation Fund Denmark [IFD]) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Relatively stringent:** For grants over DKK 500,000 (circa €67,000), a mid-term meeting is required halfway through the project. Firms must submit a presentation that details the project status in relation to the original project plan. Upon finalisation of the project, a final financial account must be submitted, which dictates the release of the final pay-out of the remaining 15% of the grant which is withheld until this point. In addition, an evaluation must be completed, and there must be a final presentation of the project progress and results. |
| ***Level of Support*** | **High:** Support can range from **DKK 50,000 to DKK 5 million (circa €6,717 - €671,700**). |
| ***Predictability*** | **Predictable:** Available since 2014. This support has been modified three times since its existence. Administrative changes made to make the programme more efficient for firms. In addition, the summer closure period was removed in 2020 to allow firms to apply over the summer. |
| ***Flexibility*** | **Relatively flexible:** If there are significant changes to the approved project, Innovation Fund Denmark must be informed. Firms can submit requests for re-budgeting. |
| ***Differentiation*** | **Less differentiated:** All firms can apply for the funding as long as they meet eligibility requirements. |
| ***Depth*** | **Deep:** Supports bringing knowledge-based innovations to the market. |

| Policy Instrument / Intervention | Grand Solutions (Innovation Fund Denmark [IFD]) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** IFD is an active partner in all *Grand Solutions* projects and engages in proactive interaction with the project for its duration. Specifically, IFD appoints one or more Investment Manager(s) to safeguard its interests in the project. IFD requires that the project undertakes thorough reviews in the project period, typically once a year. IFD requires a data management plan in the Investment Agreement and will annually request follow-up on this by the project. |
| ***Level of Support*** | **High:** IFD will cover a maximum of **75% of the project's total costs**. |
| ***Predictability*** | **Predictable:** Available since 2015. |
| ***Flexibility*** | **Less flexible:** IFD reserves the right to terminate projects, which are deemed to have made insufficient progress or considered futile or are unable to meet the goals on which IFD based its investment in the project. |
| ***Differentiation*** | **Differentiated:** The level of support depends on the **organisation type, research type, and costs**. |
| ***Depth*** | **Deep:** Supports projects with the potential to create knowledge. |

| Policy Instrument / Intervention | InnoFounder (Innovation Fund Denmark [IFD]) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** *Innofounder* must work full-time on the business idea throughout the programme (a minimum of 37 hours per week within normal work hours). *Innofounders* cannot be enrolled in a full-time study programme or be in full-time employment during the course. Midway through the *Experience programme,* an evaluation takes place where firms need to pitch their entrepreneurial idea to an expert panel. Firms are evaluated on the following criteria. **Progression**: The progress so far has resulted in an expected progression for the firm idea. **Economy**: It is still likely that, in the long term, a sustainable firm can be established, and that there is a plan for future financing. **Feasibility**: That the entrepreneurial idea is still likely to be implemented in practice. |
| ***Level of Support*** | **High:** Support available between **DKK 230,000 (circa €28,200)** for the *Graduate programme* and **DKK 460,000 (€56,400)** for the *Experienced programme.* |
| ***Predictability*** | **Predictable:** Available since 2014. The programme has been subject to consistent small amendments. |
| ***Flexibility*** | **Less flexible:** Graduate programme: If significant changes are made that affect the firm's *Innofounder* course, it must be communicated to IFD as soon as possible. Significant changes include (but are not limited to) changes to the *Innofounder*-team or significant changes to the business idea, which is funded by *Innofounder*. IFD will then decide if the change will affect the firm's *Innofounder* course. Experience programme: The *Innovation Fund* reserves the right to continuously request a status on the progress of the business idea. If the progress is not satisfactory, the *Innovation Fund* may choose to interrupt the programme ahead of time. |
| ***Differentiation*** | **Differentiated:** Has two different programmes within the overall programme: ***Innofounder Graduate*** and ***Innofounder Experienced***. Offers different amounts for each programme. |
| ***Depth*** | **Relatively deep:** Supports new graduates bringing innovative ideas to the market. |

**Table 11: Design features of innovation and science policy instruments in Denmark (2007-2020) (continued [1])**

| Policy Instrument / Intervention | Industrial Researcher Programme (Innovation Fund Denmark [IFD]) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Both the university/research institution and firm will receive 85% of the subsidies in advance. The remaining 15% will be paid when the following conditions have been met. For ***Industrial PhD*****:** The remaining 15% will be paid to the firm when Innovation Fund Denmark has received a final report (only for Industrial PhD projects approved starting in 2017) and has approved the final financial report and the auditor's certificate for the firm (all projects). The remaining 15% for the university will be paid when Innovation Fund Denmark has received the candidate's PhD certificate. For ***Industrial Postdoc*****:** The remaining 15% for the firm and the research institution will be paid once IFD has approved: Financial report from both parties; an auditor's certificate for the firm's financial report; and the project's final report. |
| ***Level of Support*** | **Medium:** Firms can receive up to **DKK 22,000 (circa €2,955)** a month. |
| ***Predictability*** | **Predictable:** Available since 1971. Structure has remained consistent since this date. |
| ***Flexibility*** | **Less flexible:** The project end date is binding and may only be adjusted in specific circumstances. If the project gets delayed, the project can be continued at the project partners own expenses. |
| ***Differentiation*** | **Differentiated:** There are **three different pathways**. Each pathway offers a different amount of funding. |
| ***Depth*** | **Deep:** Supports knowledge creation and firms' development of their innovation process. |

| Policy Instrument / Intervention | Innovation Pilot in Rural Districts (Innovation Fund Denmark [IFD]) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Firms must hire a candidate within four months of the grant approval date. When the candidate has been employed for three months, payslips are submitted. The first pay-out on a three-month grant (DKK 37,500 - circa €5,033) is then made. Subsequently, payslips are submitted for three months' time, after which the funds are disbursed. |
| ***Level of Support*** | **Medium:** Firms can receive up to **DKK 150,000 (circa €20,150)** for a year project and **DKK 300,000 (circa €42,300)** for a two-year project. |
| ***Predictability*** | **Predictable:** Available since 2014. Evaluation criteria has changed slightly twice, in 2017 and in 2020. |
| ***Flexibility*** | **Relatively flexible:** If the firm has not hired a candidate within four months from the grant date, it will lapse. It is not possible to apply for an extension. Failing to hire one candidate within the four months, however, it is possible to apply again with a similar one or another project the next time funds are offered under the scheme. If a candidate leaves the firm before the end of the project period, a replacement can be made in the remaining project period, provided there is a minimum of three months left. |
| ***Differentiation*** | **Relatively differentiated:** Only firms in **specified rural areas** can apply. |
| ***Depth*** | **Relatively deep:** Projects focus on the development of new products, new markets, services, or new production methods with commercialisation potential. |

| Policy Instrument / Intervention | Innoexplorer (Innovation Fund Denmark [IFD]) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** An instalment of 85% of the total amount will be disbursed at the start of the project period. By the end of the project, the project accounts and a professional evaluation presentation must be submitted. The remaining 15% of the investment will be disbursed when IFD have approved the project accounts and professional evaluation presentation. |
| ***Level of Support*** | **High:** *Innoexplorer* invests between DKK 500,000 and DKK 1.5 million (circa €67,200 and €201,000) in each project, and the project may last up to 12 months. |
| ***Predictability*** | **Predictable:** Available since 2019. |
| ***Flexibility*** | **Relatively flexible:** It is possible to make adjustments during the project period. |
| ***Differentiation*** | **Relatively differentiated:** *Innoexplorer* may cover up to 100% of the relevant project expenses. The institution may co-finance a part of the project budget chosen by the institution, the objective being to increase the economic efficiency of IFD's investment. |
| ***Depth*** | **Less deep**: *Innoexplorer's* aim is to strengthen utilisation of knowledge and research results from public universities and public hospitals with a view to facilitate increased knowledge-based entrepreneurship. *Innoexplorer* targets research results with commercial potential, but where the result is still at a pre-commercial stage, and where clarification or maturation is required to establish whether it can be further developed in preparation for commercial or social exploitation. *Innoexplorer* does not fund pure research projects. |

**Table 11: Design features of innovation and science policy instruments in Denmark (2007-2020) (continued [2])**

| Policy Instrument / Intervention | Independent Research Fund Denmark (IRFD; Independent Research Fund Denmark) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Relatively stringent:** Firms are expected to make contributions to project. Varies depending on project. |
| ***Level of Support*** | **High:** Average grant amount is DKK 3.2 million (circa €430,000) in 2019. |
| ***Predictability*** | **Predictable:** Available since 2004. Redesigned in 2017. The main difference is the new Fund support research thematically. In 2018, IRFD set up the Cross-Council Committee to strengthen interdisciplinary research. |
| ***Flexibility*** | **Relatively flexible:** Flexibility varies depending on the specific project. |
| ***Differentiation*** | **Differentiated:** Fund offers specific grants for specific projects. Firms can collaborate with certain projects. |
| ***Depth*** | **Relatively deep:** Supports researchers carrying out original research ideas. Firms can collaborate to benefit from the research. |

| Policy Instrument / Intervention | SMEs: Digital (Ministry for Industry, Business and Financial Affairs [MIBF]) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Firms must select an approved independent advisor. The advisor is approved to do tasks related to the project under the auspice of SMEs: Digital. |
| ***Level of Support*** | **Medium:** Grant is worth up to DKK 100,000 (circa €13,400) per annum. |
| ***Predictability*** | **Relatively predictable:** Available since 2018. |
| ***Flexibility*** | **Relatively flexible:** Firms are free to choose where they go for the consultation, but it must be approved beforehand. |
| ***Differentiation*** | **Low differentiation:** Open to all firms. |
| ***Depth*** | **Less deep:** Supports firms in their digitalisation process. |

| Policy Instrument / Intervention | Digital Hub Denmark (Ministry for Industry; Business and Financial Affairs [MIBF]) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** The firm must contribute a minimum of 50% of the total allocated resources in the project. |
| ***Level of Support*** | **Medium:** Digital Hub Denmark can contribute with up to 50% of the total allocated resources, up to circa DKK 250,000 (circa €33,500). In some cases, funding can rise potentially up to DKK 500,000 (circa €67,000). |
| ***Predictability*** | **Relatively predictable:** Available since 2018. |
| ***Flexibility*** | **Relatively flexible:** Firms must make a minimum contribution of 50% of total allocated resources for the project. |
| ***Differentiation*** | **Relatively differentiated:** *Digital Hub Denmark* usually contributes up to 50% of the total allocated resources, up to DKK 250,000 (circa €33,500). Funding can rise to DKK 500,000 (circa €67,000) in certain cases. |
| ***Depth*** | **Relatively deep:** Supports firms in their production of digital products. |

| Policy Instrument / Intervention | The Danish Growth Fund (Ministry for Industry; Business and Financial Affairs [MIBF]) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Firms must comply with the bank's and the Fund's regulations. |
| ***Level of Support*** | **Medium:** Can vary depending on the type of funding. The guarantee covers all types of financing of up to DKK 2 million (€268,000). Guarantee covers up to 75% of the financial institution's losses under collateral and other guarantees. |
| ***Predictability*** | **Predictable:** Available since 1992. Some changes over time but remained consistent. |
| ***Flexibility*** | **Less flexible:** Firms must comply with the regulations of the bank as well as the Fund's regulations. |
| ***Differentiation*** | **Differentiated:** There are a series of different loans, and options available to firms through the Fund. |
| ***Depth*** | **Less deep:** Supports firms' growth process. This can include innovation, but not required. |

**Table 11: Design features of innovation and science policy instruments in Denmark (2007-2020) (continued [3])**

| Policy Instrument / Intervention | R&D Tax Allowance (Skattekreditordningen; Ministry of Taxation) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Entity must be loss-making. The benefit applies to the part of the losses that can be attributed to R&D activities. If the firm is part of a group, the consolidated taxable income must also be negative. |
| ***Level of Support*** | **High:** Firms can claim 22% of their expenses on eligible R&D. Expenses are capped at DKK 25 million (circa €3.36 million). |
| ***Predictability*** | **Predictable:** Available since 2012. There have been changes to its structure. During the years 2012, 2013 and 2014 a firm could apply for 25% tax credit, set against the deficit they had occurred from R&D expenses. In 2015 the rate was 23.5% and in 2016 it was 22%. The maximum R&D expenses for a firm in 2012 and 2013 were DKK 5 million (circa €671 million) and the maximum deduction was DKK 1.25 million a year (€168,000). In 2014, the ceiling was raised to DKK 25 million (around €3.36 million). |
| ***Flexibility*** | **Relatively flexible:** Once minimum standard/strict definition of R&D is met, firms can claim for eligible costs. |
| ***Differentiation*** | **Less differentiated:** Available to all firms. |
| ***Depth*** | **Relatively deep:** Supports loss-making firms for carrying out R&D. |

| Policy Instrument / Intervention | Accelerated capital amortisation (Ministry of Taxation) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Spending must be on capital for R&D. |
| ***Level of Support*** | **High:** Offers credit up to DKK 1.25 million (circa €168,000). |
| ***Predictability*** | **Relatively predictable:** Structure has been consistent. |
| ***Flexibility*** | **Relatively flexible:** Firms can claim back any spending that meets the criteria. However, firms must spend on R&D. The maximum amount of credit is DKK 1.25 million (€168,000). |
| ***Differentiation*** | **Relatively differentiated:** Once the spending meets the criteria, firms are able to claim back spending on R&D capital. |
| ***Depth*** | **Relatively deep:** Supports firms purchasing capital for R&D purposes. |

| Policy Intervention / Instrument | Innovation Vouchers (Danish Agency for Science, Technology and Innovation [DASTI]) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Requires 50% co-financing. Research institutions are given the funding, not the firm themselves. |
| ***Level of Support*** | **Medium:** The value of the voucher is maximum DKK 100,000 (circa €13,400). However, as the vouchers are aimed at SMEs, it is a high amount comparatively for them. |
| ***Predictability*** | **Relatively predictable:** Vouchers are predictable in structure. Has remained consistent. |
| ***Flexibility*** | **Relatively flexible:** Firms are able to use the voucher at any approved research institution. Institutions receive the voucher, not the firm. |
| ***Differentiation*** | **Differentiated:** To be eligible, firms must be an SME with less than 12 employees and no previous formal interaction with universities or research organisations. |
| ***Depth*** | **Deep:** Enables firms to forge relationships with research institutions and aids knowledge transfer. |

| Policy Instrument / Intervention | The Innovation Incubator Programme (Innovationsmiljøer; Danish Agency for Science, Technology and Innovation [DASTI]) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Relatively stringent:** Must meet definition of innovative, new firm. Once criteria are met, firms are able to apply. |
| ***Level of Support*** | **Medium:** Support can vary depending on the stage of investment and project costs. |
| ***Predictability*** | **Predictable:** Available since 1998. Small changes have been made since but remained consistent. |
| ***Flexibility*** | **Relatively flexible:** Firms have different options of what funding they want. Flexibility varies between the stages. |
| ***Differentiation*** | **Differentiated:** The innovative incubators can engage financially with firms in three successive stages. 1) Pre-investigation; 2) Primary project funding; 3) Secondary project funding. Each stage allocated different amounts of funding and has different requirements. |
| ***Depth*** | **Relatively deep:** Supports innovative firms in the early stage of their development. |

**Table 11: Design features of innovation and science policy instruments in Denmark (2007-2020) (continued [4])**

| Policy Instrument / Intervention | Centres of Excellence (Danish Nation Research Foundation; DNRF) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Less stringent:** Excellent researchers are able to shape their own study and topic throughout the course of the programme. Researchers are able to form spin-off firms from their research. However, DNRF is funded by the Danish state and the universities are responsible for managing the grants, so the government administrative rules and legal framework for the universities must be complied with. Furthermore, a legal agreement is made between the university, the grant holder, and DNRF. |
| ***Level of Support*** | **High:** Grants are approximately DKK 10 million per year (circa €1.34 million), with a timeframe of 6 – 10 years. |
| ***Predictability*** | **Relatively predictable:** Available since 1993/94. Many *Centres of Excellence* have opened since this date. There are 44 *Centres* currently operating. Each *Centre* has somewhat different regulations. |
| ***Flexibility*** | **Flexible:** *Centres* have fixed budgets throughout their duration. However, excellent researchers can study topics and questions that are of interest to them. Researchers can form spin-offs from the research. |
| ***Differentiation*** | **Differentiated:** Different centres have different research interests and topics. |
| ***Depth*** | **Deep:** Supports the creation of knowledge on key issues in Denmark, which can lead to spin-off firms from the funded research. |

**Sources of information used in compiling Table 11: European Commission (2020i; 2020j), EuroScientist (2014), Greve (2018), Innovation Fund Denmark (2018; 2020a; 2020b; 2020c; 2020d; 2020e; 2020f; 2020g; 2020h), Independent Research Fund Denmark (2018; 2020a; 2020b), Knudsen et al (2018), Ministry of Higher Education and Science (2015; 2020), Ministry of Science, Innovation and Higher Education (2013), OECD STIP Compass (2020c; 2020d), OECD (2019).**

## Section 3.6 Norway

There are many funding agencies/government bodies responsible for innovation and science policy instruments at the firm level in Norway. These include:

1. Innovation Norway (Innovasjon Norge)

*Innovation Norway* is the Norwegian Government agency that supports firms in developing competitive advantage through innovation in Norway (Visit Norway, 2020). *Innovation Norway's* programmes and services are intended to create more successful entrepreneurs, more firms with capacity for growth and more innovative business clusters (Norwegian Chamber, 2020). *Innovation Norway* contributes to the following areas: promoting Norwegian firms; securing development in rural areas; enhancing innovation in Norwegian firms and industry; building competitive Norwegian firms at both domestic and international markets; transforming ideas into successful business cases; promote interaction between firms, knowledge communities and R&D institutions (Visit Norway, 2020).

2. Ministry of Education and Research (KD; Kunnskapsdepartementet)

The *Ministry of Education and Research* (KD; Kunnskapsdepartementet) is responsible for primary and secondary school, upper secondary and tertiary vocational education, and higher education sectors. The Ministry is also responsible for research and integration (Government.no 2020). KD supports firms conducting R&D through the Regional Research Fund programme. Research results from R&D projects that are funded in whole or in part by a regional research fund should benefit society, both through the development and dissemination of knowledge and commercial exploitation (RCN, 2018).

3. The Research Council of Norway (RCN; Norges forskningsråd)

The *Research Council of Norway* (RCN) is a Norwegian government agency responsible for awarding grants for research and science (OECD STIP, 2020e). RCN also advises the Government on matters related to research, and is subordinate to the Norwegian Ministry of Education and Research (Geothermica, 2020). RCN is responsible for promoting basic and applied research, and innovation. This is achieved by managing research funding and by advising government authorities on research policy (RCN, 2020a). The Research Council was established in 1993 through the merging of five different previously created research councils. RCN offers firms a series of innovation and science policy instruments (RCN, 2020a). These instruments can involve funding projects directly, or supporting collaborations with research institutions (OECD STIP, 2020e).

4. Norwegian Agency for Development Cooperation (Norad)

The *Norwegian Agency for Development Cooperation* (Norad) operates under the directorate of the Norwegian Ministry of Foreign Affairs and reports to the Norwegian Ministry of Climate and Environment on environmental issues (Norad, 2020a). The main purpose of Norad is to ensure that Norwegian development aid funds are spent in the best possible way, and to report on what works and what does not work (Norad, 2020b). Norad grants funding to organisations

within civil society, research, higher education, and industry that work with partners in less developed countries (Norad, 2020c). Norad is responsible for overseeing Norway's *Vision 2030* programme, which aims to stimulate innovative ideas and fund innovation projects in firms that can help attain the global United Nations (UN) Sustainable Development Goals for health and education (Norad, 2017).

5. Norwegian Tax Administration (Skatteetaten)

The *Norwegian Tax Administration (Skatteetaten)* is a government agency responsible for resident registration (National Population Register) and tax collection in Norway (The Norwegian Tax Administration, 2020). The agency is subordinate to the Ministry of Finance. The Tax Administration's goal is to secure the financing of the welfare state (The Norwegian Tax Administration, 2020). The *Norwegian Tax Administration* offers support to firms through an R&D Tax Credit scheme (SkatteFunn, 2020). This allowance can see firms receive a 19 percent decrease limited up to a cost base of NOK 25 million, approximately €2.3 million (OECD STIP, 2020f). The supported projects should aim to generate new knowledge, information, or experience (PwC, 2020).

6. Enova

*Enova* is owned by the Ministry of Climate and Environment. *Enova* contributes to reduced greenhouse gas emissions, development of energy and climate technology and a strengthened security of supply (Enova, 2020a). To achieve this, *Enova* supports Norway's renewable energy resources effectively by investing in innovation and technology development (Enova, 2020a). These investments must be sustainable and financially viable, and aim to help Norway on the path to becoming a low emission society (Enova, 2020b). The rationale for these investments is that it can be prohibitively expensive and risky for individual firms to start using the newest and most climate-friendly technologies (Enova, 2020a). Therefore, *Enova* supports firms in making these investments. *Enova* can make a financial contribution so that projects can still be implemented (Enova, 2020a). Each year, *Enova* invests more than NOK 2 Billion (approximately €187.5 million) of public resources in solutions towards projects that build a greener Norway (Enova, 2020a).

**Table 12: Innovation and science policy instruments available to firms in Norway (2007-2020)**

| Policy Instrument / Intervention | Innovation Contracts (First introduced in 1968) |
|---|---|
| ***Agency responsible*** | Innovation Norway |
| ***Criteria / Eligibility Requirements*** | Available to Norwegian-owned SMEs. Recipient SMEs must demonstrate they have the skills and knowledge necessary to develop products or services needed by large firms, which are not available in the market. The recipient SME works on the project to deliver the product or service to the large firm. The large firm can be foreign or Norwegian-owned. The large firm is referred to as pilot customers. The objective of innovation contracts is to stimulate innovation and value creation by reducing risk. The programme may cover up to **45% of the development costs** incurred by the Norwegian firm. The large firm should make contributions worth up to at least 20% of total eligible project costs. This contribution is in terms of workload and funding. |
| ***What is the support for?*** | Stimulate innovation and value creation by reducing risk for firms. **Promote the development of new products, services and solutions** for the national and international market. |
| ***Funding and Scale*** | Exact funding and scale unavailable. Innovation Norway typically spends up to NOK 300 million (circa €28.9 million) a year on contracts. |

| Policy Instrument / Intervention | Environmental Technology Programme (First introduced in 2010) |
|---|---|
| ***Agency responsible*** | Innovation Norway |
| ***Criteria / Eligibility Requirements*** | Available to all firms in Norway. The programme is particularly aimed at large-scale projects and large firms (more than 250 employees). Project must provide lasting value creation in Norway in the form of new jobs, strengthened competence and increased competitiveness. Maximum support rate is **70% of the cost base for small firms**, **60% for medium-sized firms** and **50% for large firms**. Can be combined with innovation loans. *Innovation Norway* can only fund up to 80% of project costs with a combination of support. Applicant is expected to also use the project to update internal expertise on innovation processes. A firm can receive an increased grant for new solutions that are above current EU environmental standards. Firms must demonstrate that solutions are above current standards before the grant is awarded. |
| ***What is the support for?*** | Grant scheme for **pilot and demonstrations projects** with a positive environmental impact. |
| ***Funding and Scale*** | Exact funding details unavailable. NOK 750 million (circa €70.3 million) allocated in 2020. |

| Policy Instrument / Intervention | Innovation Loans (First introduced in 2004) |
|---|---|
| ***Agency responsible*** | Innovation Norway |
| ***Criteria / Eligibility Requirements*** | Available to all firms in Norway, excluding traditional trade in goods, personal services, rental firms, craft services or other firms that mainly have a local or regional market. Typically finances up to 50% of the capital requirement. If the project needs funding in excess of 50%, it is assessed on a case-by-case basis. **Up to NOK 50 million (circa €4.7 million)** can be granted in innovation loans per firm. The repayment period on *Innovation Loans* is adapted to the project type and is normally up to 15 years. Loans are normally disbursed after project completion and accrued costs have been audited. Partial payment in the event of milestones achieved or advance payment can be agreed separately in the individual case. Nominal interest rate 3.95%. |
| ***What is the support for?*** | Used for **commercialisation of new solutions**, strengthening of working capital, restructuring, development, growth, and internationalisation. |
| ***Funding and Scale*** | Exact funding and scale unavailable. |

**Table 12: Innovation and science policy instruments available to firms in Norway (2007-2020) (continued [1])**

| Policy Instrument / Intervention | Pre-Seed Capital Scheme (First introduced in 2015) |
|---|---|
| ***Agency responsible*** | Innovation Norway |
| ***Criteria / Eligibility Requirements*** | Available to Norwegian-registered, innovative start-up firms with significant growth potential. The firm must be younger than five years from its date of registration and cannot be listed on the stock exchange. Firms must be preparing for growth and fulfil the following requirements: a) on the basis of an evaluation carried out by an external expert, the firm must document that they will develop products, services or processes that are new or significantly improved compared to the latest in the industry, and entails a technological or industrial risk; b) R&D costs constitute a minimum of 10% of the total operating costs in at least one of the last three years before the investment, or if it is a start-up firm without historical accounts, in updated auditor-certified interim accounts. Investments can amount to between **NOK 500,000 and NOK 3 million (circa €46,800 and €281,200)** per firm. |
| ***What is the support for?*** | Promotes **growth in innovative start-ups**. |
| ***Funding and Scale*** | Exact funding and scale unavailable. |

| Policy Instrument / Intervention | Start-Up Grants (First introduced in 2009) |
|---|---|
| ***Agency responsible*** | Innovation Norway |
| ***Criteria / Eligibility Requirements*** | Available to start-up firms in Norway. Firm must be less than 3 years old (in some cases firms can be less than five years old). Grant can cover up to 50% of the eligible costs. Programmes divided between two phases: **Phase 1 grants** are for pre-market evaluation, with a maximum size between **NOK 50,000 and NOK 100,000 (circa €4,600 and €9,300**) and support activities such as customer surveys, testing and development of solutions, networking and competence building. **Phase 2 grants** are for commercialisation. They can be up to **NOK 500,000 or NOK 700,000 (circa €46,800 and €65,600)** depending on the international potential, and support activities such as product/service development (including design or collaboration with pilot customers). The support level is up to 50% for intramural costs and up to 75% for extramural costs. Firms are expected to match the investment. |
| ***What is the support for?*** | *Start-Up Grants* **support promising start-ups with new ideas** with large growth potential, enabling them to make fundamental investments in firm and market development. |
| ***Funding and scale*** | Exact funding and scale unavailable. |

| Policy Instrument / Intervention | Regional Research Funds (First introduced in 2010) |
|---|---|
| ***Agency responsible*** | Ministry of Education and Research (KD) and Research Council Norway (RCN) |
| ***Criteria / Eligibility Requirements*** | Available to firms and public sector research institutions in Norway, depending on the type of project. There are three types of project: public sector, research, and business projects. Selection criteria for **business projects** include: Track record of applicant; Feasibility of project; Anticipated return on investment; Societal impact anticipated; Geographical location; Alignment with national strategic priorities. The exact amount of funding is dependent on the project length and the municipality. Funding can range from between **NOK 100,000 – NOK 3 million (circa €9,300 and €281,000)**. Projects duration can be between 2 and 36 months. |
| ***What is the support for*** | *Regional Research Funds* aim to increase **research capacity** through regional research and innovation. |
| ***Funding and Scale*** | NOK 1.9 billion (circa €178 million), 4,828 applications (2010 – 2018) |

| Policy Instrument / Intervention | Industrial PhDs (First introduced in 2008) |
|---|---|
| ***Agency responsible*** | Research Council of Norway (RCN) |
| ***Criteria / Eligibility Requirements*** | Available to all firms in Norway. The Project Owner (firm) and degree-conferring institution must enter into a written collaboration agreement. The doctoral project must be completed over three or four years. The maximum amount of funding provided by RCN to doctoral projects under the Industrial PhD scheme is 50% of the rate for doctoral fellowships in effect at the time the application is submitted. For 3-year PhDs, the maximum yearly amount in 2020 is **NOK 562,500 (circa €52,700)**. For a 4-year PhD, the yearly support in 2020 is **NOK 421,875 (circa €39,500)**. Funding is disbursed as project support to the firm, not as a personal grant to the candidate. |
| ***What is the support for?*** | **Boost research efforts and long-term competence-building** for Norwegian trade and industry through the recruitment of doctoral candidates. |
| ***Funding and Scale*** | Firms have received approximately NOK 377 million (circa €31.37 million) through the Industrial PhD Scheme in the last 5 years (2014 to 2019). 329 projects have received funding during this time. |

**Table 12: Innovation and science policy instruments available to firms in Norway (2007-2020) (continued [2])**

| Policy Instrument / Intervention | Norwegian Centres of Excellence (SFF; First introduced in 2002) |
|---|---|
| ***Agency responsible*** | Research Council of Norway (RCN) |
| ***Criteria / Eligibility Requirements*** | Available to Higher Education Institutions (HEIs), or research institutes that have an extensive basic research portfolio. A host institution for a centre may cooperate with one or more research institutions, organisations or firms in respect of the establishment, operation and funding of the centre and thus form a *Centre of Excellence* consortium. SFF centres may receive support for a total of ten years. The main level for the annual funding of each centre is **NOK 8–13 million (circa €750,000 and €1.2 million)**, with a maximum of NOK 18 million (circa €1.7 million). The support from the scheme amounts to around 20% of the centre's income. Criteria for funding includes: Novelty of research or its application; Track record; Scientific impact anticipated. |
| ***What is the support for?*** | The SFF scheme gives Norway's foremost scientific groups the opportunity to organise their activities in centres that seek to achieve **ambitious scientific objectives** through collaboration and long-term basic funding. |
| ***Funding and Scale*** | NOK 328 million (circa €30.7 million), 26 centres in 2018. |

| Policy Instrument / Intervention | Centres for Research-based Innovation scheme (First introduced in 2005) |
|---|---|
| ***Agency responsible*** | Research Council of Norway (RCN) |
| ***Criteria / Eligibility Requirements*** | Available to consortiums including Higher Education Institutions (HEIs), independent research institutes, R&D-performing firms or R&D-performing public service providers. Must have the required research resources for the scheme. The partners in the consortium must contribute to the centre in the form of funding, facilities, competence, and their own efforts throughout the life cycle of the centre. Each centre receives an allocation of around **NOK 9 – 12 million (circa €840,000 and €1.1 million) per year** and the consortium must contribute with at least the same amount as RCN, and the industry partners are expected to contribute at least 25% of the costs. *Centres for Research-based Innovation* operate on shorter cycles than *Centres of Excellence*, with 5 years of initial funding and the possibility of 3 further years of funding. The continued funding is dependent on the results of a mid-project evaluation. |
| ***What is the support for?*** | The *Centres for Research-based Innovation* funds collaborative science-industry research centres. The programme allows firms to **influence research priorities and utilise new research methods and findings**. |
| ***Funding and Scale*** | The *Centres for Research-based Innovation scheme* does not provide support to firms. RCN provides support to a research organisation and requires firms to participate as partners. Firms that participate as partners in a *Centre for Research-based Innovation* must cover their own costs. In 2018, NOK 273 million (circa €25.6 million) was allocated to projects on this basis. |

| Policy Instrument / Intervention | FORREGION – Programme on Research-Based Regional Innovation (First introduced in 2018) |
|---|---|
| ***Agency responsible*** | Research Council of Norway (RCN) |
| ***Criteria / Eligibility Requirements*** | Available to all Norwegian firms. The *FORREGION* programme has three main components (pillars): 1) Broadly-based instruments to encourage wider use of research-based innovation (competence brokering, feasibility studies); 2) Knowledge-building projects, known as capacity enhancement projects, to strengthen competence building and research activity for industries in areas with particular potential or special needs; and 3) Knowledge and dialogue about regional efforts related to research-based innovation. *FORREGION* offers different support for firms under each of their three pillars. This includes: feasibility studies where firms work with a R&D group on their project; Researcher, industry or student for loan where a researcher works for a period in a firm or a firm's employee works for a period in a research and educational institution. Aims to enhance value creation, competitiveness and restructuring capacity throughout the country, based on the unique opportunities and challenges of each region. Offers a series of support for this purpose. Funding can range **between NOK 100,000 and NOK 3 million (circa €9,300 and €281,000)**. |
| ***What is the support for*** | The FORREGION programme aims to strengthen the connection between regional, national and international efforts to **promote research-based innovation**. |
| ***Funding and Scale*** | In 2018, the first full year of the programme, NOK 50 million (circa €4.6 million) was allocated, across 208 projects. |

**Table 12: Innovation and science policy instruments available to firms in Norway (2007-2020) (continued [3])**

| Policy Instrument / Intervention | Norwegian scheme for independent research projects (FRIPRO; First introduced in 1993) |
|---|---|
| ***Agency responsible*** | Research Council of Norway (RCN) |
| ***Criteria / Eligibility Requirements*** | Available to approved research organisations (can include collaboration with other research organisations). Firms cannot be partners, but they can be suppliers of R&D services to the projects. FRIPRO is an open, national competitive arena for project-based funding within all fields of research. There are no thematic guidelines and no requirements relating to the applicability or immediate utility of the research. The competition in FRIPRO is fierce, with a grant application success rate of between 8 and 12% in recent years. The scientific quality of the projects and the ground-breaking and professionally innovative character (referred to as the 'excellence' assessment criterion) are emphasised more than the other assessment criteria when applications are selected for funding from FRIPRO. The exact amount of funding received varies depending on the project. The *Research Council of Norway* and Norway's research institutions are providing a total of NOK 1 billion (circa €93.7 million) to 46 FRIPRO Toppforsk projects (FRIPRO –Frie prosjektmidler). Each project will receive **NOK 15 – 25 million (circa €1.4 million and €2.3 million)** over a four-to-five-year period. |
| ***What is the support for?*** | Promote scientific quality at the forefront of international research. **Foster boldness in scientific thinking and innovation**. Supports careers for young researchers. |
| ***Funding and scale*** | NOK 2.8 billion (circa €262.4 million), 6,064 applications (2005-2010) |

| Policy Instrument / Intervention | Commercialising R&D Results Programme (FORNY2020; First introduced in 2011; Continuation of previous FORNY Programme [1995 – 2010]) |
|---|---|
| ***Agency responsible*** | Research Council of Norway (RCN) |
| ***Criteria / Eligibility Requirements*** | Available to all newly established firms whose activities are based partially or entirely on intellectual property from publicly funded research institutions are eligible to apply for funding for proof-of-concept activities under the FORNY2020 programme. The programme does not provide support for research activities. The programme allocates funding for activities to verify and document the application of R&D results and confirm whether the results can lead to substantial commercial returns or be of some other major benefit to society. The programme facilitates the commercialisation of results from projects conducted at publicly funded research institutions and helps bring the products and services to the market. The programme provides funding to newly established firms based on these projects as well as to Technology Transfer Offices (TTOs) affiliated with the research institutions. In 2018, projects were **80% funded with at least 20% contribution** from the institution and/or industry partner. Duration is between one to three years. |
| ***What is the support for?*** | Facilitates the **commercialisation of results from projects** conducted at publicly funded research institutions and helps to bring the products and services to the market. |
| ***Funding and scale*** | 138 firms have received funding the last 5 years. Total funding during this period to firms/start-ups was NOK 260 million (circa €24.2 million). |

| Policy Instrument / Intervention | NANO – Large-scale Research Programme on Nanotechnology, Microtechnology and Advanced Materials (First introduced in 2012) |
|---|---|
| ***Agency responsible*** | Research Council of Norway (RCN) |
| ***Criteria / Eligibility Requirements*** | Available to firms and research institutions. A variety of supports are available under the *NANO* programme, including the *Innovation Project for the Industrial Sector* (IPN) and *Knowledge-Building Project for Industry* (KPN). **Innovation Project for the Industrial Sector (IPN):** An R&D project designed to lead to innovation (value creating renewal) for the firms participating in the project. The Project Owner and any partners will generally fund at least 50% of the project costs. **Knowledge-Building Project for Industry (KPN):** Projects contribute to industry-oriented researcher training and long-term competence development in the Norwegian research community and are designed around identified needs for new knowledge in Norwegian firms. The firms play an active role in the management of the project. The support provided by RCN may not exceed a maximum of four times the total cash contribution from the firms. Funding and project length can vary depending on the project call. Current calls for proposals have projects with durations from 4 months to 72 months, and funding ranges from **NOK 100,000 to NOK 20 million (circa €9,300 and €1.9 million)**. |
| ***What is the support for*** | Provides **funding for research and innovation** on microtechnology, nanotechnology and advanced materials. |
| ***Funding and scale*** | NOK 716 million (circa €67 million), 95 projects (2012 – 2016) |

**Table 12: Innovation and science policy instruments available to firms in Norway (2007-2020) (continued [4])**

| Policy Instrument / Intervention | Vision 2030 (First introduced in 2014; First year of programme 2016) |
|---|---|
| ***Agency responsible*** | Norwegian Agency for Development Cooperation (Norad); Innovation Norway; Research Council of Norway (RCN) |
| ***Criteria / Eligibility Requirements*** | Available to all private firms in Norway. Offers support for projects in the health and education fields. Minimum project size **NOK 1.5 million (circa €140,600)**. Project length is one to three years. 30% of the support is paid in advance when the conditions for the grant are met and the project has commenced. 50% of the support is paid in accordance with the agreed milestone plan. The remaining 20% is paid when the project is completed. The project must include R&D activities for a product or service innovation. The applicant must have intellectual property rights for the project or solution. The financing mechanism has a limit up to NOK 150 million (circa €14 million). |
| ***What is the support for?*** | An initiative to **stimulate innovative ideas and fund innovation projects** that can help attain the global United Nations (UN) Sustainable Development Goals for health and education. |
| ***Funding and Scale*** | NOK 75 million (circa €703,000), 11 projects (2016 – 2017) |

| Policy Instrument / Intervention | Skattefunn – R&D Tax Credit Scheme (First introduced in 2002) |
|---|---|
| ***Agency responsible*** | Norwegian Tax Administration and Research Council of Norway (RCN) |
| ***Criteria / Eligibility Requirements*** | Available to firms of all sizes. As of 2020, the deduction is set at **19% for all firms**. Costs for in-house R&D have a limit of **NOK 25 million (circa €2.3 million)** per income year. The main criterion for applying for *SkatteFUNN* is that the firm has an R&D project with the aim of developing a new or improved asset, service, or production process. There are no requirements regarding type of firm. The project must be limited and focused, and it must be aimed at generating new knowledge, information or experience. The application for *SkatteFUNN* must be approved by *The Research Council of Norway* (RCN) and is awarded for a maximum period of up to three years. If the application is approved, there is a requirement to submit a form attested by the firm's auditor, together with the ordinary tax return, to obtain the tax incentive. |
| ***What is the support for*** | *Skattefunn* is an R&D tax credit scheme that aims to **increase R&D activity** by reducing the marginal costs of R&D projects. Aims to stimulate R&D in the business sector. |
| ***Funding and scale*** | Over the last 5 years, an average of 3,928 firms have claimed this support per year, with total claims amounting to NOK 16.9 billion (circa €1.5 billion). |

| Policy Instrument / Intervention | Enova SF (First introduced in 2001) |
|---|---|
| ***Agency responsible*** | Enova |
| ***Criteria / Eligibility Requirements*** | Available for all firms in all sectors. *Enova* provides funding and advice to overcome market barriers to the development and deployment of energy-efficient, climate-friendly solutions. *Enova* can contribute to projects in energy and climate technology from the pilot phase to commercialisation. *Enova* also offers investment support for energy projects, where it seeks to derive maximum value in terms of energy for the support it provides. For a firm to receive support from *Enova*, the support must be necessary for the implementation of the project. *Enova* cannot support measures that would have been implemented without financial support. Projects that have already started are therefore not eligible for funding from *Enova*. The energy support covers all sectors, including transport, and includes subsidies to households for investments in energy-smart solutions. The average level of funding per project was NOK 3.46 million (circa €324,318) in 2019. |
| ***What is the support for?*** | *Enova* is a public enterprise that promotes a transition to environmentally sustainable energy production and use, and the development of energy and climate technology. Enova aims to help push ideas in energy efficiency to the market and **ensure these innovations increase in both scope and speed**. |
| ***Funding and scale*** | NOK 5.2 billion (circa €487.4 million), 1,500 energy and climate projects (2019) |

**Sources of information used in compiling Table 12: Enova (2020a; 2020b), Geothermica (2020), Government.no (2020), Green Congress (2014), Innovation Norway (2020a; 2020b; 2020c; 2020d; 2020e; 2020f), Norwegian Agency for Development Cooperation (2017; 2020a; 2020b; 2020c), OECD STIP Compass (2020e; 2020f), PricewaterhouseCooper (2020), Research Council Norway (2018; 2019; 2020a; 2020b; 2020c; 2020d; 2020e; 2020f).**

**Table 13: Design features of innovation and science policy instruments in Norway (2007-2020)**

| Policy Instrument / Intervention | Innovation Contract (Innovation Norway) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** The firm must make contributions in terms of workload and incurred cost of at least 20% of total eligible project costs. |
| ***Level of Support*** | **High:** Support up to **45% of the costs** incurred by the firm. |
| ***Predictability*** | **Predictable:** Available since 1968. Expanded in 1994 to also include R&D contracts with private customers. |
| ***Flexibility*** | **Relatively flexible**: Some changes are allowed if they can be justified. |
| ***Differentiation*** | **Less differentiated:** Firms can participate once eligibility requirements are met. |
| ***Depth*** | **Relatively deep:** Supports firms bringing innovative solutions to the market. |

| Policy Instrument / Intervention | Environmental Technology Programme (Innovation Norway) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** A preliminary study must often be carried out in advance of an innovation project, where the purpose is to clarify important prerequisites for the project. The firm is expected to finance this phase itself. |
| ***Level of Support*** | **High:** The maximum support rate is **70% of the cost base for small firms**, **60% for medium-sized firms** and **50% for large firms**. |
| ***Predictability*** | **Predictable:** Available since 2010. Structure has remained consistent. |
| ***Flexibility*** | **Relatively flexible:** *Innovation Norway* can finance up to 80% of the approved support by combining grants and loans. |
| ***Differentiation*** | **Differentiated:** Firms can receive different rates depending on their size. There can be collaboration bonuses for projects. Projects can receive up to 15% bonus for collaboration. |
| ***Depth*** | **Relatively deep:** Supports firms carrying out innovation with environmentally friendly technology. The *Programme* can offer increased support for solutions which are currently ahead of available EU technology. |

| Policy Instrument / Intervention | Innovation Loans (Innovation Norway) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** The loans are normally disbursed after the project has been completed and accrued costs have been audited. |
| ***Level of Support*** | **High:** Firms can receive up to **NOK 50 million (circa €4.7 million)**. |
| ***Predictability*** | **Predictable:** Available since 2004. |
| ***Flexibility*** | **Less flexible:** Once a firm receives the loan, it must comply with the bank's and Innovation Norway's regulation. |
| ***Differentiation*** | **Differentiated:** Loans typically have a nominal interest rate of 3.95%. Up to NOK 50 million (circa €4.7 million) can be granted in innovation loans per firm. There is **an option to receive better interest rates** through the European Investment Fund. |
| ***Depth*** | **Less deep:** Covers a wide range of innovation activities. Does not focus on knowledge creation. |

| Policy Instrument / Intervention | Pre-Seed Capital Scheme (Preåkornfond; Innovation Norway) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** It is not possible to invest in firms that are defied as 'in difficulty'. |
| ***Level of Support*** | **High:** Investments from the fund can amount to **between NOK 500,000 and NOK 3 million (circa €46,800 and €281,200)** per firm. |
| ***Predictability*** | **Relatively predictable:** Available since 2015. Amount received dependent on investors. |
| ***Flexibility*** | **Relatively flexible:** The 50% of co-funding that must be from independent investors can be made up from other funds or crowdfunding. |
| ***Differentiation*** | **Less differentiated:** Available to all firms once eligibility requirements are met. |
| ***Depth*** | **Less deep:** Supports innovative start-up firms in the early stages of their growth. |

**Table 13: Design features of innovation and science policy instruments in Norway (2007-2020) (continued [1])**

| Policy Instrument / Intervention | Start-Up Grants (Etablerertilskudd; Innovation Norway) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Relatively stringent:** Typically, firms must be start-ups or meet the definition of what classifies an SME. In some cases, larger firms can qualify. |
| ***Level of Support*** | **Medium:** Offers grants ranging from **NOK 50,000 and NOK 100,000 (circa €4,600 and €9,300)** in Phase 1, or up to **NOK 500,000 or NOK 700,000 (circa €46,800 and €65,600)** in Phase 2. |
| ***Predictability*** | **Predictable:** Available since 2009. |
| ***Flexibility*** | **Relatively flexible:** Firms can carry out research over 13 – 24 months. |
| ***Differentiation*** | **Differentiated: Offers grants in 2 phases** with different requirements and funding levels available. |
| ***Depth*** | **Less deep:** Contributes to the realisation of growth ambitions and value creation potential, which include innovation projects. |

| Policy Instrument / Intervention | Regional Research Funds (Regionale forskningsfond; Ministry of Education and Research [KD] and Research Council Norway [RCN]) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** For business projects, a recipient firm is expected to match the investment it receives. |
| ***Level of Support*** | **High:** Wide range of support, between **NOK 100,000 and NOK 3 million (circa €9,300 and €281,000)**. |
| ***Predictability*** | **Relatively predictable:** Available since 2010. From 2010-2020, funds were controlled by seven regions composed of two to three county municipalities. The country structure was reformed with effect from January 2020. Each county municipality appoints a board to administer the funds. The board award competitive R&D funding based on the county-specific regional innovation and development strategies. |
| ***Flexibility*** | **Relatively flexible:** Exact flexibility may vary depending on project. |
| ***Differentiation*** | **Differentiated:** Business project recipients are expected to **match the level of investment**. |
| ***Depth*** | **Deep:** The results of research should benefit society, both through the development and dissemination of knowledge and commercial exploitation. |

| Policy Instrument / Intervention | Industrial PhDs (The Research Council of Norway [RCN]) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Funding will not be disbursed as a lump sum allocation and will be adjusted to reflect costs entered in the accounts. Funding under the Industrial PhD Scheme will only be provided for project activity that is defined as industrial research and fundamental research. |
| ***Level of Support*** | **Medium:** Yearly support for a project ranges between **NOK 421,875 and NOK 632,500 (circa €39,500 and €52,700)**. |
| ***Predictability*** | **Predictable:** Available since 2008. |
| ***Flexibility*** | **Relatively flexible:** Firms face strict eligibility criteria. As long as firms comply with criteria, there is some flexibility. |
| ***Differentiation*** | **Differentiated:** There are **different yearly and monthly maximum amounts** depending on the year and duration of PhD. |
| ***Depth*** | **Deep:** Aims to create knowledge to solve problems. Builds link between firms and academia. |

| Policy Instrument / Intervention | Norwegian Centres of Excellence (SFF; The Research Council of Norway [RCN]) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Continued funding (after initial 5 years) is subject to a positive mid-evaluation review. Mid-term review typically takes place after 3 and a half years. |
| ***Level of Support*** | **High:** Each centre receives typically between **NOK 8 – 13 million (circa €750,000 and €1.2 million)** with a maximum of **NOK 18 million (circa €1.7 million)**. |
| ***Predictability*** | **Predictable:** Available since 2002. Some centres have closed during the 18 years, and new centres have started. |
| ***Flexibility*** | **Flexible:** Centres can obtain additional funding along with the SFF funding (e.g. EU funding). |
| ***Differentiation*** | **Differentiated:** Different centres focus on **different topics** and may receive different amounts. |
| ***Depth*** | **Deep:** Supports the knowledge creation. |

**Table 13: Design features of innovation and science policy instruments in Norway (2007-2020) (continued [2])**

| Policy Instrument / Intervention | The Centres for Research-based Innovation scheme (The Research Council of Norway [RCN]) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Continued funding (after initial 5 years) is subject to a positive mid-project evaluation. The consortium must contribute with at least the same amount as RCN, and the industry partners are expected to contribute at least 25% of the costs. |
| ***Level of Support*** | **High:** Each centre receives around **NOK 9 – 12 million (circa €840,000 and €1.1 million)** per year. |
| ***Predictability*** | **Predictable:** Available since 2005. Operate on five to eight-year cycles. |
| ***Flexibility*** | **Relatively flexible:** Firms may face different restrictions depending on the centre and the project. |
| ***Differentiation*** | **Differentiated:** Different centres **may receive different amounts of funding**. Research interests may differ. |
| ***Depth*** | **Deep:** Primarily support the creation of new knowledge. All research conducted by *The Centres for Research-based Innovation*, including research funded by the user partners, is to be long-term in nature and is expected to promote increased innovation capacity and provide a basis for greater value creation. |

| Policy Instrument / Intervention | FORREGION – Research-Based Regional Innovation (The Research Council of Norway [RCN]) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Must comply with set obligations and regulations. |
| ***Level of Support*** | **Medium:** Up to **NOK 200,000,** or 50% of project costs. |
| ***Predictability*** | **Predictable:** Available since 2018. Structure has remained consistent. |
| ***Flexibility*** | **Relatively flexible:** Some changes are allowed in the project, within strict limits. |
| ***Differentiation*** | **Relatively differentiated:** The amount of funding varies from region-to-region. **5%** of the grant funds are set aside for the county municipalities of Troms and Finnmark, and Nordland with an equal amount to each county municipality. Of the rest, **60%** is distributed with one equal amount to each county municipality and **40%** based on the county municipalities' population. |
| ***Depth*** | **Deep:** Aims to stimulate closer co-operation between R&D institutions and strength connections to firms and the public sector, with a goal of new knowledge creation. |

| Policy Instrument / Intervention | Norwegian scheme for independent research projects (FRIPRO; The Research Council of Norway [RCN]) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Only approved research organisations can apply for funding from the Council. |
| ***Level of Support*** | **High:** Offers **NOK 15 – NOK 25 million (circa €1.4 million and €2.3 million)** over a four-to-five-year period. |
| ***Predictability*** | **Predictable:** Available since 1993. Structure has largely remained consistent. |
| ***Flexibility*** | **Relatively flexible:** Some flexibility that researchers can shape their own research ideas. However, funding is awarded based on well-written applications. Deviations should be explained. |
| ***Differentiation*** | **Differentiated:** The **amount funded varies** depending on the project, and the associated costs. |
| ***Depth*** | **Relatively deep:** Aims to support innovative research and professional renewal. |

| Policy Instrument / Intervention | Commercialising R&D Results Programme (FORNY2020; The Research Council of Norway [RCN]) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** There must be at least 20% contribution from the institution and/or industry partner. |
| ***Level of Support*** | **High:** The maximum budget is **NOK 5 million (circa €468,000)**. |
| ***Predictability*** | **Predictable:** Available since 2011. Continuation of previous *FORNY Programme*. |
| ***Flexibility*** | **Relatively flexible:** Some changes are eligible within the programme. |
| ***Differentiation*** | **Differentiated:** Projects **can receive different amounts** depending on the project, and the duration. |
| ***Depth*** | **Relatively deep:** Supports commercialisation based partially or entirely on R&D results from publicly funded research institutions. Brings innovations to the market. |

**Table 13: Design features of innovation and science policy instruments in Norway (2007-2020) (continued [3])**

| Policy Instrument / Intervention | NANO – Large-scale Research Programme on Nanotechnology, Microtechnology and Advanced Materials (The Research Council of Norway [RCN]) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Firm/Industry partners are expected to make contributions to project costs. |
| ***Level of Support*** | **High:** Covers a wide range of support across the different project types. Offers up to **NOK 20 million (circa €1.87 million)**. |
| ***Predictability*** | **Predictable:** Available since 2012. Continuation of the previously available NANOMAT programme. |
| ***Flexibility*** | **Relatively flexible:** Covers a wide range of activities. Some changes are allowed within activities. |
| ***Differentiation*** | **Differentiated:** There are **different project types**. Funding and duration vary depending on the project proposal. |
| ***Depth*** | **Deep:** *NANO* aims to support projects and activities that help **develop knowledge**. |

| Policy Instrument / Intervention | Vision 2030 (Norwegian Agency for Development Cooperation [Norad]) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** 30% of the support is paid in advance when the conditions for the grant are met and the project has commenced. 50% of the support is paid in accordance with the agreed milestone plan, and the remaining 20% is paid when the project is completed. |
| ***Level of Support*** | **High:** Typical minimum project size **NOK 1.5 million (circa €140,600)**. |
| ***Predictability*** | **Predictable:** Available since 2016. Structure has remained consistent. |
| ***Flexibility*** | **Relatively flexible:** Payment of the grant is tied to a report, specifying previously agreed deliverables and any deviations that have been experienced. |
| ***Differentiation*** | **Relatively differentiated:** Supports project that contribute to global **United Nations (UN) Sustainable Development Goals** for health and education. |
| ***Depth*** | **Relatively deep:** Supports the transfer of Norwegian information on education and health to other countries. |

| Policy Instrument / Intervention | R&D Tax Incentive (Skattefunn; Ministry of Taxation and The Research Council of Norway [Norway]) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Firms are required to submit a form attested by the firm's auditor, together with the ordinary tax return, to obtain the tax incentive. |
| ***Level of Support*** | **High:** Offers a **19% tax deduction** to all firms. |
| ***Predictability*** | **Predictable:** Available since 2002. |
| ***Flexibility*** | **Relatively flexible:** Firms must meet definition of R&D to qualify but can select their own R&D projects. |
| ***Differentiation*** | **Less differentiated:** Before 2020, SMEs had a 20% deduction while large firms had 18%. Now **all firms have the same deduction rate** (19%), regardless of size. |
| ***Depth*** | **Deep:** Supports projects that aim to generate new knowledge, information, or experience. |

| Policy Instrument / Intervention | Enova SF (Enova) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** For a firm to receive support from *Enova*, the support must be necessary for the implementation of the project. *Enova* is inspected to ensure that the project would not have been implemented without the financial support. Projects that have already commenced are ineligible. |
| ***Level of Support*** | **High:** The exact level of **funding varies depending on the project**. *Enova* can offer high levels of support. For example, in 2014 *Enova* pledged NOK 1.55 billion (circa €150 million) in investment backing for a pilot to trial a new aluminium production technology. |
| ***Predictability*** | **Predictable:** Available since 2001. Structure and aims have remained consistent. Funding may vary depending on the project. |
| ***Flexibility*** | **Less flexible:** *Enova* does not contribute more support than necessary. The support must be sufficient for the project to be completed, but not any higher. |
| ***Differentiation*** | **Less differentiated:** Available to all firms **across all sectors** as long as the project relates to climate and environment friendly technology. |
| ***Depth*** | **Relatively deep:** Supports firms making environment friendly innovations and bringing them to the market. |

**Sources of information used in compiling Table 13: Enova (2020a; 2020b), Geothermica (2020), Government.no (2020), Green Congress (2014), Innovation Norway (2020a; 2020b; 2020c; 2020d; 2020e; 2020f), Norwegian Agency for Development Cooperation (2017; 2020a; 2020b; 2020c), OECD STIP Compass (2020e; 2020f), PricewaterhouseCooper (2020), The Research Council Norway (2018; 2019; 2020a; 2020b; 2020c; 2020d; 2020e; 2020f).**

## Section 3.7 Israel

There are many funding agencies/government bodies responsible for innovation and science policy instruments at the firm level in Israel. These include:

1. Israel Innovation Authority (IIA)

The *Israel Innovation Authority* (IIA)[6] is an independent publicly funded agency, set-up to provide a variety of practical tools and funding platforms to foster a dynamic and innovative industrial ecosystem (IIA, 2020a). This ecosystem includes: early-stage entrepreneurs; mature firms developing new products or manufacturing processes; academic groups seeking to transfer their ideas to the market; global corporations interested in collaborating with Israeli technology; Israeli firms seeking new markets abroad; and traditional factories and plants seeking to incorporate innovative and advanced manufacturing into their firms (IIA, 2020b). To meet the various needs of its wide range of clients, the IIA is organised around six primary innovation divisions (IIA, 2020b). Each division offers a unique toolbox of customised and comprehensive incentive programs. These divisions serve as a launch pad for successful innovative projects, providing entrepreneurs and firms with the most relevant plan for them to implement their ideas, develop their products, and mobilise private investment (IIA, 2020a). These divisions include: Start-up Division, Growth Division, Technological Infrastructure, International Collaboration, Advanced Manufacturing, and Societal Challenges (IIA, 2020b).

2. The Singapore-Israel Industrial R&D Foundation (SIIRD)

The *Singapore-Israel Industrial R&D Foundation* (SIIRD) is a co-operation between the Enterprise Singapore (ESG) and the Israel Innovation Authority to promote, facilitate and support joint industrial R&D collaboration between Singapore-based firms and Israel-based firms across different industries (SIIRD, 2020a). Through joint R&D collaboration and SIIRD's funding, firms have: created new/enhanced products and technology; expanded product portfolio for customers; created new markets; and shortened time to bring new/enhanced products and technology into the market (SIIRD, 2020a). SIIRD seeks to promote R&D in Singapore and Israel by helping Singapore-based and Israel-based firms with R&D partner search, providing approximately NIS 3.4 million (circa €843,000) in funding for joint R&D projects (SIIRD, 2020a).

3. India-Israel Industrial R&D and Technological Innovation Fund (I4F)

The *India-Israel Industrial R&D and Technological Innovation Fund* (I4F) is a cooperation between the Department of Science and Technology (DST), Government of India, and the Israel Innovation Authority (IIA) to promote, facilitate, and support joint industrial R&D projects, between firms from India and Israel (DST, 2020). I4F is aimed at promoting, facilitating, and supporting joint Industrial R&D between India & Israel, which lead to co-development and commercialisation of innovative technologies benefiting both countries (IIA, 2020c).

[6] For more information on the innovation and science policy instruments offered by The Israel Innovation Authority, see https://innovationisrael.org.il/en/contentpage/israel-innovation-authority

4. Israel's Agency for International Development Cooperation (MASHAV)

Israel's *Agency for International Development Cooperation* (MASHAV) operates under the auspices of the Israeli Ministry of Foreign Affairs. MASHAV is responsible for the design, coordination and implementation of Israel's worldwide development and cooperation programs in developing countries (Embassy of Israel in Ghana, 2020). MASHAV's development programs are conducted through workshops and training in the fields of agriculture, education and medicine, and are funded jointly with multinational organisations such as the Inter-American Development Bank, the United Nations (UN) development plan, Educational, Scientific and Cultural Organisation (UNESCO) and the Food and Agriculture Organisation (Israelink, 2020). Firms are supported to carry out R&D and commercialise the products and services towards the market in developing countries (IIA, 2020d).

5. The Korea-Israel Industrial R&D Foundation (KORIL-RDF)

The *Korea-Israel Industrial R&D Foundation* (KORIL-RDF) is a binational foundation, incorporated in 2001, which is owned and financed jointly by the governments of Israel and Korea (IIA, 2020e). In Israel, the KORIL-RDF is under the auspices of the Ministry of Economy & Industry; and in Korea under the Ministry of Trade, Industry and Energy (IIA, 2020e). Its mission is to promote and support technological collaboration in innovative R&D between commercial firms from all sectors in both countries (IIA, 2020e). Grants can be obtained through KORIL-RDF that support up to 50% of the direct R&D expenses between Korean and Israeli firms, and KORIL-RDF helps firms to commercialise research outputs (IIA, 2020f).

6. Israel-U.S. Binational Industrial Research and Development (BIRD) Foundation

The *Israel-U.S. Binational Industrial Research Foundation* (BIRD) was established by the U.S. and Israeli governments in 1977 to generate mutually beneficial cooperation between U.S. and Israeli firms, including start-ups and established firms (BIRD, 2020a). BIRD provides both matchmaking support between U.S. and Israeli firms, as well as funding covering up to 50 percent of project development costs, up to approximately NIS 3.4 million (circa €843,000) per project (BIRD, 2020b). BIRD's scope extends to: Agriculture, Communications, Construction Technologies; Electronics; Electro-optics; Life Sciences; Software; Homeland Security; Renewable and Alternative Energy and other technology sectors (BIRD, 2020b). BIRD supports approximately 20 projects annually (BIRD, 2020a). Since its inception in 1977, BIRD has approved 1,000 projects with leading firms in the U.S (BIRD, 2020b).

7. The Canada-Israel Industrial Research and Development Foundation (CIIRDF)

The *Canada-Israel Industrial Research and Development Foundation* (CIIRDF) stimulates collaborative research and development between private sector firms in both countries, with a focus on the commercialisation of new technologies (CIIRDF, 2020a). CIIRDF's main activities are as follows: promote and communicate the strategic and commercial benefits of Canada-Israel R&D collaboration; deliver a matchmaking service that brings together Canadian and Israeli firms seeking R&D partners; and help to broker new technology collaborations; and financially support bilateral R&D initiatives that cross many scientific disciplines, technologies and industrial sectors (CIIRDF, 2020a).

**Table 14: Innovation and science policy instruments available to firms in Israel (2007-2020)**

| Policy Instrument / Intervention | The R&D Fund (First introduced in 1970) |
|---|---|
| ***Agency responsible*** | Israel Innovation Authority (IIA) |
| ***Criteria / Eligibility Requirements*** | Available to all firms in the high-tech sector. Firms receive a conditional grant of 20% to 50% of approved R&D expenditures. Firms operating in favourable development regions are eligible for additional support of 10% to 25%. Approved projects in the nanotechnology and biotechnology sectors may receive 50% grant support. R&D projects conducted in geographical areas designated as 'Development Area A' are eligible for grants of 60% of their total approved R&D budget. Projects that have received support from another governmental source are not eligible for further assistance by the *R&D Fund*. |
| ***What is the support for*** | The *R&D Fund* is a general framework for approval of requests for support from start-ups, Small and Medium-sized Enterprises (SMEs), and larger established firms, which was created to reduce risk in industrial innovation. |
| ***Funding and Scale*** | Exact funding details are unavailable. |

| Policy Instrument / Intervention | GCI – Grand Challenges Israel Incentive Program (First introduced in 2014) |
|---|---|
| ***Agency responsible*** | Israel Innovation Authority (IIA) and Israel's Agency for International Development Cooperation (MASHAV) |
| ***Criteria / Eligibility Requirements*** | Available to researchers, entrepreneurs, SMEs (up to 100 employees), research institutions and Non-Governmental Organisations (NGOs) based in Israel. Support targets firms and entrepreneurs targeting markets in developing countries for global health, water, and agritech. Offers support of up to 90% of approved project costs, up to a maximum of NIS 500,000 (circa €123,000). Firms must aim to commercialise the innovation stemming from the work as part of the programme. |
| ***What is the support for?*** | Support and encourage innovation targeted at solving global health and food security challenges in the developing world. |
| ***Funding and Scale*** | Exact funding details are unavailable. |

| Policy Instrument / Intervention | Large Companies' R&D Centers in Israel's Periphery (First introduced in 2010) |
|---|---|
| ***Agency responsible*** | Israel Innovation Authority (IIA) |
| ***Criteria / Eligibility Requirements*** | Available to large firms with an annual turnover of NIS 341.6 million (€84.3 million) or more, that is generated from business activities within Israel. Aims to bridge the gap between Israel's centre and periphery by encouraging large firms to open R&D centres in areas with lower economic growth. Qualifying firms can receive multi-annual (24-36 months) support of 65% - 75% for their R&D centre's approved expenses. |
| ***What is the support for?*** | Supports firms to set up an R&D centre in Israel's periphery. |
| ***Funding and Scale*** | Exact funding details are unavailable. |

| Policy Instrument / Intervention | Generic R&D Track for Large Companies (First introduced in 2002) |
|---|---|
| ***Agency responsible*** | Israel Innovation Authority (IIA) |
| ***Criteria / Eligibility Requirements*** | Available to Israeli firms with annual sales of more than NIS 341.6 million (circa €84.6 million) and over 200 R&D employees in Israel; or alternatively, with an R&D budget in Israel that exceeds NIS 68.3 million (circa €16.8 million). Firms receive financial support at a rate of 20% to 50% of the approved R&D expenditures for long-term R&D programs or for a R&D project in collaboration with another Israeli firm. Firms operating in development areas are entitled to an additional 10% support. |
| ***What is the support for?*** | To promote high-risk R&D activity in the business sector. To encourage large firms to work on technological infrastructures that have high spill-over potential and may disrupt markets in the future. |
| ***Funding and Scale*** | Exact funding details are unavailable. |

**Table 14: Innovation and science policy instruments available to firms in Israel (2007-2020) (continued [1])**

| Policy Instrument / Intervention | Innovation Labs Incentive Program (First introduced in 2017) |
|---|---|
| ***Agency responsible*** | Israel Innovation Authority (IIA) |
| ***Criteria / Eligibility Requirements*** | Available to all firms and entrepreneurs. The scheme offers different support depending on the size of the firm. **Larger firms:** Three-year license with the possibility to extend the license for an additional three years. Five-year license in the *Digital Health* and *Bio-Convergence Innovation Labs*, with possibility for extension. The Authority will fund: up to **NIS 4 million (circa €1 million)** for the *Lab's* establishment (33% of the costs, 50% in the periphery areas); **up to NIS 6 million (circa €1.47 million)** for the *Digital Health* and *Bio-Convergence Labs*; and up to **NIS 500,000 or up to NIS 1 million (circa €123,000 and €246,000)** for the Digital Health and *Bio-Convergence Labs* (50% of the approved budget) of the ongoing operating expenditures of the lab, each year. **Start-up firms:** 85% of the approved budget over a period of one year, and extended support for the second year/period at 50% of the approved budget. |
| ***What is the support for?*** | Encourage industrial corporations, with an emphasis on those engaged in advanced manufacturing, to cooperate with technology entrepreneurs as leverage for growth and for the formation of a strategy for the future. |
| ***Funding and Scale*** | Exact funding details are unavailable. |

| Policy Instrument / Intervention | Ideation (Tnufa) Incentive Program |
|---|---|
| ***Agency responsible*** | Israel Innovation Authority (IIA) |
| ***Criteria / Eligibility Requirements*** | Available to entrepreneurs and Israeli start-up firms. The *Ideation (Tnufa) Incentive Program* is designed for fledgling entrepreneurs to develop and validate innovative technological concepts. Entrepreneurs and new Israeli start-up firms can receive a conditional grant of up to **NIS 200,000 (circa €49,200)** over a period of two years: NIS 100,000 (€24,600) awarded each year (85% of the approved budget). The funds can be used for building an initial prototype, intellectual property protection and business development, including materials, degradable components, sub-contractors and consultants, patent attorneys and exhibition expenses (not intended for salaries and overhead expenses). The entrepreneurs are not obliged to leave their current job to establish a firm as a condition for receiving the support or to give up rights to the project. The incentive programme offers participation in the risks involved in the firm's development process but not in future profits or successes. A firm undertakes to repay the grants received by the IIA via royalty payments from product sales. |
| ***What is the support for?*** | The scheme supports entrepreneurs reaching proof of concept and business feasibility of early stage projects. |
| ***Funding and Scale*** | Exact funding details are unavailable. |

| Policy Instrument / Intervention | Biotechnology Incubator Track |
|---|---|
| ***Agency responsible*** | Israel Innovation Authority (IIA) |
| ***Criteria / Eligibility Requirements*** | Available to start-up firms in the biotechnology sector. Different types of support available. **Start-up firms:** Project budget of up to NIS 8.1 million (circa €2 million) for a period of up to three years. Full financial support at the rate of 100% of the budget approved for the firm (85% from IIA, 15% from the incubator) and no financial investment is required on the part of the firm. Offers infrastructure for R&D, technological and business assistance from the incubator. **Biotechnology greenhouses:** The IIA finances 85% of the budget for an approved project. The incubator invests 15% of the approved budget in exchange for receiving up to 50% of the firm's shares. |
| ***What is the support for*** | Supports entrepreneurs interested in establishing a start-up firm **based on a biotechnological idea**, at the beginning of their enterprise journey. |
| ***Funding and Scale*** | Exact funding details are unavailable. |

**Table 14: Innovation and science policy instruments available to firms in Israel (2007-2020) (continued [2])**

| Policy Instrument / Intervention | Technology Transfer Programme (MAGNETON; First introduced in 2000) |
|---|---|
| ***Agency responsible*** | Israel Innovation Authority (IIA) |
| ***Criteria / Eligibility Requirements*** | Available to two groups in Israel: 1) **Firms seeking to incorporate new technologies developed in academia** and striving to develop new products or to improve existing products; 2) **Academic research groups** from research institutes and institutes approved by IIA's *Technological Infrastructure Division*, seeking to carry out innovative and original applied research in collaboration with an Israeli firm interested in the relevant technology. The research should be focused on technological feasibility for the industry, and the applying research institute should be the sole owner of knowledge in the project. Applied research grant at a rate of up to **66% of the approved budget**, **up to an amount of NIS 3.4 million (circa €837,000)**, for a period of up to 24 months. The technology must be mature enough for the industrial corporation to begin the stages of knowledge assimilation and validate the firm. |
| ***What is the support for?*** | Promotes **technology transfer from academic institutions to industry** via mutual cooperation between an industrial firm and an academic research group. |
| ***Funding and scale*** | Exact funding details are unavailable. |

| Policy Instrument / Intervention | R&D Track with Multinational Corporations (MNCs) |
|---|---|
| ***Agency responsible*** | Israel Innovation Authority (IIA) |
| ***Criteria / Eligibility Requirements*** | Available to Israeli technology firms. Particularly young and innovative start-ups, engaged in R&D and that are interested in developing into new markets and channels of activity in Israel and abroad. This framework provides a favourable approach and supportive work environment for Israeli firms looking to collaborate with MNCs. Within the framework, both IIA and the MNC commit to equally invest in pre-selected R&D projects, conducted jointly by the MNC and the Israeli firm. Financial support at a rate of **up to 50% of the approved R&D expenses** of the Israeli firm. Firms operating in development areas are entitled to an **additional 10% support**. There is no budget ceiling in this track. The firm can receive assistance and support from the partner MNC in the form of consulting, services and resources. Resources can be *in-kind*, including access to data, unique expertise and skills. |
| ***What is the support for?*** | Provides Israeli firms support for collaborations with MNCs in **commercialisation-oriented development projects** of new technological products or in upgrading existing technology. |
| ***Funding and scale*** | Exact funding details are unavailable. |

| Policy Instrument / Intervention | MOFET – R&D in the Manufacturing Industry |
|---|---|
| ***Agency responsible*** | Israel Innovation Authority (IIA) |
| ***Criteria / Eligibility Requirements*** | Available to firms or industrial factories incorporated in Israel. To be eligible firms **must meet one** of the following criteria: at least 50% of the firm's revenue in the previous year stems from industrial manufacturing in either the **1)** traditional or mixed-traditional technology sectors; or **2)** the mixed-high technology or high technology sectors. Support of between **30% - 50% of R&D expenses** of the approved programmes with a budget up to NIS 500,000 (circa €123,000). Firms can receive an increment of 10% for R&D projects in Development Regions. Firms can receive an increment of 10% if at least 30% of the project's authorised budget is implemented in a recognised research institute. |
| ***What is the support for?*** | To encourage export-focused firms to **promote and implement innovative technological processes**. |
| ***Funding and scale*** | Exact funding details are unavailable. |

| Policy Instrument / Intervention | Incentive Program for Innovation with Government Entities (First introduced in 2018) |
|---|---|
| ***Agency responsible*** | Israel Innovation Authority (IIA); Ministry of Transportation; Ministry of Health; Ministry of Environmental Protection; Ministry of Agriculture; National Cyber Directorate |
| ***Criteria / Eligibility Requirements*** | Available to Israeli technology firms. Support firms in their R&D programs or trial programs in selected fields, according to calls for proposals. The amount of support varies depending on the program. The **standard support** system is **20%-50%** of approved expenditures in most cases, with potential **exceptional support** of up to **75%**. Firms' projects must have the potential to make an exceptional impact to receive additional support. |
| ***What is the support for?*** | Supports for high-risk initiatives with supplementary support of regulatory entities with the regulatory requirements for pilot tests and access to government-owned trial sites and facilities. Influence further levels of local innovation ecosystems resulting from the **market introduction of results from funded projects**. |
| ***Funding and scale*** | Exact funding details are unavailable. |

**Table 14: Innovation and science policy instruments available to firms in Israel (2007-2020) (continued [3])**

| Policy Instrument / Intervention | Incentive Program for Innovation with Government Entities (First introduced in 2018) |
|---|---|
| ***Agency responsible*** | Israel Innovation Authority (IIA), Ministry of Transportation; Ministry of Health; Ministry of Environmental Protection; Ministry of Agriculture; National Cyber Directorate. |
| ***Criteria / Eligibility Requirements*** | Available to Israeli technology firms. Supports firms in their R&D programs or trial programs in selected fields, according to calls for proposals. The amount of support varies depending on the program. The **standard support** system is **20%-50%** of the approved pilot's expenditures in most cases. Potential for **exceptional support** of up to **75%**. Firms' projects must have the potential to make an exceptional impact to receive additional support. |
| ***What is the support for?*** | Supports high-risk initiatives with supplementary support of regulatory entities with the regulatory requirements for pilot tests and access to government-owned trial sites and facilities. Influence further levels of local innovation ecosystems resulting from the **market introduction of results from funded projects**. |
| ***Funding and scale*** | Exact funding details are unavailable. |

| Policy Instrument / Intervention | Singapore – Israel Industrial R&D Foundation (SIIRD; First introduced in 1997) |
|---|---|
| ***Agency responsible*** | Israel Innovation Authority (IIA) and Enterprise Singapore (ESG) |
| ***Criteria / Eligibility Requirements*** | Available to any registered Israeli and Singaporean firms including start-ups, SMEs and MNCs, subject to eligibility criteria. The application must be jointly submitted by an Israel-registered firm and a Singapore-registered firm. Either firm must not have more than 20% shareholding in the partnering firm. The joint project must be undertaken in Singapore and Israel, with at least 30% of the actual R&D work located in Singapore and Israel respectively. Technology and product developed must have potential for commercialisation. SIIRD provides R&D funding up to **NIS 3.4 million (circa €834,000)** for joint R&D projects between firms based in Israel and Singapore. Projects are evaluated on various aspects ranging from the collaborative relationship of the firms to the innovation of the project, and the market need for the proposed product. |
| ***What is the support for?*** | **Promote, facilitate, and support joint industrial R&D collaboration** between Singapore-based firms and Israel-based firms across different industries. |
| ***Funding and scale*** | NIS 382.6 million (€94.7 million), 114 projects (1997 – 2012) |

| Policy Instrument / Intervention | Israel-India Industrial R&D and Technological Innovation Fund (I4F; First introduced in 2018) |
|---|---|
| ***Agency responsible*** | Israel Innovation Authority (IIA); India's Department of Science and Technology (DST); Government of India |
| ***Criteria / Eligibility Requirements*** | Available to all firms in all technology fields. Priority is given to technology development projects related to water, agriculture, health, energy, and Information and Communications Technology (ICT). Applicants should already possess basic infrastructures/testbeds, prototyping capabilities, and have developed initial Proof of Concept (POC) for the proposal. IIA will support projects a range of **NIS 853,000 to NIS 4.3 million (circa €211,000 and €1 million)** per project or 50% of the Israeli Project Cost (whichever is lower). Project duration is up to 24 months. |
| ***What is the support for?*** | The objective of this programme is to respond to the **global issues concerning science and technology**, while developing technologies that can be commercialised and localised within two years through joint cooperation between India and Israel. |
| ***Funding and scale*** | Exact funding details are unavailable. Since 2018, the fund has provided NIS 136.6 million (circa €33.8 million) over five years to support joint projects. |

**Table 14: Innovation and science policy instruments available to firms in Israel (2007-2020) (continued [4])**

| Policy Instrument / Intervention | The Korea-Israel Industrial R&D Foundation (KORIL-RDF; First introduced in 2001) |
|---|---|
| ***Agency responsible*** | Korea-Israel Industrial R&D Foundation (KORIL-RDF) |
| ***Criteria / Eligibility Requirements*** | Available for all firms from Israel and Korea that are collaborating to develop a joint technological and innovative project. At least 30% of the actual R&D work must be located in Korea and Israel. The exact budget may vary depending on the year. The Israeli and Korean governments raise **approximately NIS 13.4 million (circa €3.38 million)** a year for the projects. |
| ***What is the support for*** | KORIL-RDF supports **industrial R&D projects that lead to potential commercialisation** and contribute to the economic progress of the two countries. |
| ***Funding and Scale*** | NIS 184 million (circa €45.5 million), over 140 projects (2001 – 2016) |

| Policy Instrument / Intervention | Israel-US Binational Industrial Research and Development (BIRD) Foundation (First introduced in 1977) |
|---|---|
| ***Agency responsible*** | BIRD Foundation (Israel-US Binational Industrial Research and Development Foundation) |
| ***Criteria / Eligibility Requirements*** | Available to all firms in Israel and the United States (US) that wish to work on a joint project. BIRD provides support of up to 50% of a project's budget, beginning with R&D and ending with the initial stages of sales and marketing. BIRD shares the risk and requires repayment if the project achieves revenue. IIA funds **up to 50%** of each firm's R&D expenses associated with the joint project, **up to NIS 3.4 million (approx. €834,000) per project**. Repayments are due if commercial revenues are generated as a direct result of the project. |
| ***What is the support for?*** | Encourage cooperation between Israeli and US firms in a wide range of technology sectors by providing funding and assistance in **facilitating strategic partnerships for developing joint products or technologies**. |
| ***Funding and scale*** | NIS 1.18 billion (circa €291.9 million), 427 out of 967 projects (1977 – 2017) |

| Policy Instrument / Intervention | Canada-Israel Industrial R&D Foundation (CIIRDF; First introduced in 1994) |
|---|---|
| ***Agency responsible*** | Canada-Israel Industrial R&D Foundation (CIIRDF) |
| ***Criteria / Eligibility Requirements*** | Available to for-profit firms operating and registered in Israel. The foundation invests in two types of bilateral R&D initiatives undertaken by Canadian and Israeli partners. **Feasibility studies:** up to six months in duration. CIIRDF contributes up to 50% of the joint study costs, to a maximum of approximately **NIS 51,522 (circa €12,897)**. **Collaborative R&D projects:** up to three years in duration. CIIRDF contributes up to 50% of joint project costs up to a maximum of approximately **NIS 2 million (circa €515,800)**. Funding is split between the firms depending on each firms' contribution to the project's budget. As technology commercialisation is a key goal of CIIRDF, the jointly developed product should be near 'market-ready' by the conclusion of the project. Projects are funded across many scientific disciplines, technologies, and industrial sectors. |
| ***What is the support for?*** | Promotes, stimulates and invests in **collaborative R&D** between firms in Canada and Israel, with a focus on the commercialisation of new technologies. |
| ***Funding and scale*** | Exact funding scale unavailable. |

**Sources of information used in compiling Table 14: Canada-Israel Industrial Research and Development Foundation (2020a; 2020b), Department of Science and Technology (2020), Israel Innovation Authority (2020a; 2020b; 2020c; 2020d; 2020e; 2020f; 2020g; 2020h; 2020i; 2020j; 2020k; 2020l; 2020m; 2020n; 2020o; 2020p; 2020q; 2020r), Israel-U.S. Binational Industrial Research and Development Foundation (2020a; 2020b; 2020c), Korea-Israel Industrial R&D Foundation (2020), OECD STIP Compass (2020g), Singapore-Israel Industrial R&D Foundation (2020a; 2020b), Slideshare (2012).**

**Table 15: Design features of innovation and science policy instruments in Israel (2007-2020)**

| Policy Instrument / Intervention | The R&D Fund (Israel Innovation Authority [IIA]) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** A firm is obligated to pay royalties when a government-assisted R&D project results in a commercially successful product. |
| ***Level of Support*** | **High:** Firms receive a conditional grant of **20% to 50%** of the approved R&D expenditures, with the potential for additional support. |
| ***Predictability*** | **Predictable:** Available since 1970, and has remained consistent in structure since introduction. |
| ***Flexibility*** | **Less flexible:** Projects that have received support from another governmental source are not eligible for further assistance by the Fund. |
| ***Differentiation*** | **Differentiated:** Firms can receive **different levels of funding** based on their location. |
| ***Depth*** | **Deep:** Supports high-tech firms in their innovation process. |

| Policy Instrument / Intervention | GCI – Grand Challenges Israel Incentive Program (Israel Innovation Authority [IIA]) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** The applicant must act in accordance with the reporting obligation, the registration obligation, the royalty obligation, the obligation to preserve knowledge and intellectual property as specified |
| ***Level of Support*** | **Medium:** Offers support of **90%** of the approved budget up to a ceiling of **NIS 500,000 (circa €123,000)**. |
| ***Predictability*** | **Predictable:** Available since 2014. |
| ***Flexibility*** | **Less flexible:** Exact specifications may vary depending on the challenge. However, there is a strict application process. Firms must carry out the project as closely as possible to the original application. |
| ***Differentiation*** | **Less differentiated:** Offers support up to 90% of the approved budget up to a ceiling of NIS 500,000 (circa €123,000). Varies **depending on the project and challenge**. |
| ***Depth*** | **Deep:** Supports firms to carry out R&D to boost their innovation process. |

| Policy Instrument / Intervention | Large Companies' R&D Centers in Israel's Periphery (Israel Innovation Authority [IIA]) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** The firm must commit to hiring a substantial number of employees living in Israel's periphery, reaching 50% of total approved manpower in its second year of support, and 60% in its third year. |
| ***Level of Support*** | **High:** Offers **up to 75%** of the approved budget. |
| ***Predictability*** | **Predictable:** Available since 2010. Remained consistent since then. |
| ***Flexibility*** | **Relatively flexible:** The day to day operations in the Centres have flexibility once they meet agreed requirements. |
| ***Differentiation*** | **Differentiated:** Specifically **targets firms** locating **in Israel's peripheral region**. |
| ***Depth*** | **Deep:** Supports firms in their innovation process. |

| Policy Instrument / Intervention | Generic R&D Track for Large Companies (Israel Innovation Authority [IIA]) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** The submitting firm must be investment-intensive in R&D. Once approved, the firm must act in accordance with the reporting obligation, the registration obligation, the royalty obligation, the obligation to preserve knowledge and intellectual property as specified. |
| ***Level of Support*** | **High:** Can receive grants **up to 50% (or potentially up to 75%)** of approved budget. |
| ***Predictability*** | **Predictable:** Available since 2002. |
| ***Flexibility*** | **Less flexible:** Projects should be focused and limited in scope. |
| ***Differentiation*** | **Differentiated:** Firms receive financial support at a rate of **50% - 20%** of the approved R&D expenditures for: **long-term research and development programs** or **R&D project** in collaboration with another Israeli firm. |
| ***Depth*** | **Deep:** Supports large firms in their innovation process. |

**Table 15: Design features of innovation and science policy instruments in Israel (2007-2020) (continued [2])**

| Policy Instrument / Intervention | Innovation Labs Incentive Program (Israel Innovation Authority [IIA]) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** *Innovation Labs* have a series of obligations, including: admitting firms approved by an IIA committee to the lab; assisting firms in the formulation and testing of the product; feasibility testing and marketing preparations; and pilot execution, according to the supported project's needs and milestones set by the IIA committee. |
| ***Level of Support*** | **High:** Offers different levels of support, including support **up to NIS 6 million (circa €1.47 million)**. |
| ***Predictability*** | **Predictable:** Available since 2017. Structure has been consistent. |
| ***Flexibility*** | **Less flexible:** Laboratories must carry out research in their intended purpose. |
| ***Differentiation*** | **Differentiated:** Offers different levels of support **depending on the firm size**. |
| ***Depth*** | **Relatively deep:** Supports firms' innovation process. |

| Policy Instrument / Intervention | Ideation (Tnufa) Incentive Program (Israel Innovation Authority [IIA]) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Relatively stringent:** Firms can use the grant in many different ways. Firms repay the grants received by the Authority via royalty payments from product sales. |
| ***Level of Support*** | **Medium:** Offers support up to **NIS 200,000 (circa €49,200)** over a period of two years. **NIS 100,000 (circa €24,600)** a year. |
| ***Predictability*** | **Relatively predictable:** Structure has remained consistent. |
| ***Flexibility*** | **Relatively flexible:** Firms can spend the grant for building an initial prototype, intellectual property protection and business development. |
| ***Differentiation*** | **Differentiated:** Specifically aimed at **start-up firms and entrepreneurs**. |
| ***Depth*** | **Relatively deep:** Supports fledgling entrepreneurs to develop and validate innovative technological concepts. |

| Policy Instrument / Intervention | Biotechnology Incubator Track (Israel Innovation Authority [IIA]) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Relatively stringent:** Firms must comply with the rules throughout the duration of the project. |
| ***Level of Support*** | **High:** Funds **up to 100%** of approved budget. 85% from IIA, and 15% from the *Incubator*. |
| ***Predictability*** | **Relatively predictable:** Structure has been consistent. |
| ***Flexibility*** | **Relatively flexible:** Firms must carry out semi-annual periodic reports. Some changes are allowed if justified. |
| ***Differentiation*** | **Differentiated:** Different types of support available for **start-up firms and biotechnology greenhouses** (a specific form of incubator targeted at biotechnology start-ups). |
| ***Depth*** | **Deep:** Supports biotechnology firms in developing their innovative ideas and their innovation process. |

| Policy Instrument / Intervention | Technology Transfer Programme (MAGNETON; Israel Innovation Authority [IIA]) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** The firm must act in accordance with the reporting obligation, the registration obligation, the royalty obligation, the obligation to preserve knowledge and intellectual property. |
| ***Level of Support*** | **High:** Firms can receive an applied research **grant at a rate of up to 66%** of the approved budget, up to an amount of **NIS 3.4 million (circa €837,000)**, for a period of up to 24 months. |
| ***Predictability*** | **Predictable:** Available since 2000. Structure has remained consistent. |
| ***Flexibility*** | **Flexible:** At both the end of the project and at the end of proving the technological feasibility, firms can decide whether to exercise the right to commercialise and continue the independent process of developing a commercial product from joint research. |
| ***Differentiation*** | **Less differentiated:** All firms and research institution partnerships are **eligible to apply**. |
| ***Depth*** | **Deep:** Encourages the transfer and commercialisation of technologies from research institutions to firms. |

**Table 15: Design features of innovation and science policy instruments in Israel (2007-2020) (continued [3])**

| Policy Instrument / Intervention | R&D Track with Multinational Corporations (MNC) Program (Israel Innovation Authority [IIA]) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** After the application is approved and before receiving the grant, an official agreement is required between the Israeli firm and MNC. Firms must submit reports at scheduled times. |
| ***Level of Support*** | **High:** The non-MNC firms can receive **up to 50% of the approved R&D expenses**. 10% additional funding for firms in development areas. Exact figures vary from project to project. The MNC involved in the project can also offer contributions. |
| ***Predictability*** | **Relatively predictable:** The level of support has been consistent. However, the MNC involved and the opportunities can vary across different proposals calls. |
| ***Flexibility*** | **Relatively flexible:** The extent of changes allowed varies depending on the project and the MNC involved. |
| ***Differentiation*** | **Differentiated:** Firms in **development area can receive an additional 10% in funding.** However, the MNC involved and the projects can be quite different from each other. MNCs can make their own financial contributions, or in-kind contributions throughout the duration of the project. |
| ***Depth*** | **Relatively deep:** Supports Israeli firms carrying out R&D with MNCs. Focused on commercialising new technological products. |

| Policy Instrument / Intervention | R&D in the Manufacturing Industry (MOFET; Israel Innovation Authority [IIA]) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Firms must meet conditions to qualify for support. |
| ***Level of Support*** | **Medium:** Offers support between **30% - 50%** of programmes with a budget **up to NIS 500,000 (circa €123,000)**. An incremental increase of 10% can be offered for R&D projects in *Development Regions*. An incremental increase of 10% can be offered if at least 30% of the authorised budget is implemented in a recognised research institute. |
| ***Predictability*** | **Relatively predictable:** Structure has remained largely consistent. A call for proposals was issued for *R&D Plans of Industrial Products for the Prevention and Treatment of the COVID-19* in 2020. Proposals for this call were evaluated under an expedited process. |
| ***Flexibility*** | **Relatively flexible:** Some changes are allowed during the project. |
| ***Differentiation*** | **Differentiated:** Offers a series of **different grants with different levels of support**. |
| ***Depth*** | **Relatively deep:** Grants covers all areas of innovation process, including the acquisition of knowledge necessary for the R&D project. |

| Policy Instrument / Intervention | Incentive Program for Innovation with Government Entities (Israel Innovation Authority [IIA]) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** The firm must act in accordance with the reporting obligation, the registration obligation, the royalty obligation, the obligation to preserve knowledge and intellectual property as specified. |
| ***Level of Support*** | **High:** Offers financial support that covers approved expenditure. **Exact amount depends on the project and the program**. No fixed budget. |
| ***Predictability*** | **Relatively predictable:** Structure has remained consistent. |
| ***Flexibility*** | **Relatively flexible:** Exact specifications varies depending on project. |
| ***Differentiation*** | **Differentiated:** Firms can receive funding on **a wide range** of different scales. |
| ***Depth*** | **Relatively deep:** Supports firms' innovation process. |

| Policy Instrument / Intervention | Singapore – Israel Industrial R&D Foundation (SIIRD; Israel Innovation Authority [IIA] and Enterprise Singapore [ESG]) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** To receive funding, firms must make reports throughout the duration of the project. |
| ***Level of Support*** | **High:** Firms receive support of **up to 50%** of eligible costs. Depending on the grant firms avail of they can receive funding worth up to **NIS 102,000 (circa €25,300)**, up to **NIS 683,000 (circa €169,000)**, or between **NIS 683,000 and NIS 3.4 million (circa €169,000 and €834,000)**. |
| ***Predictability*** | **Predictable:** Available since 1997. Structure has remained consistent. |
| ***Flexibility*** | **Relatively flexible:** Firms are able to make some changes. Must be justified in progress reports. |
| ***Differentiation*** | **Differentiated:** There are **three types of project grants available**. Offers different levels of support. |
| ***Depth*** | **Relatively deep:** Supports is concerned with introducing new products and technology to the market. |

**Table 15: Design features of innovation and science policy instruments in Israel (2007-2020) (continued [4])**

| Policy Instrument / Intervention | Israel-India Industrial R&D and Technological Innovation Fund (I4F; Israel Innovation Authority [IIA], India's Department of Science and Technology [DST] and Government of India) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** The firm must act in accordance with the reporting obligation, the registration obligation, the royalty obligation, the obligation to preserve knowledge and intellectual property. |
| ***Level of Support*** | **High:** Support firms for **up to NIS 834,000 (circa €210,000)** or **50%** of the eligible costs (whichever is lower). |
| ***Predictability*** | **Relatively predictable:** Available since 2018. There are calls for proposals twice per year. |
| ***Flexibility*** | **Less flexible:** Projects have a maximum duration of 24 months. Projects are expected to be able to be **commercialised after two years**. |
| ***Differentiation*** | **Less differentiated:** Available to **all firms** who meet eligibility requirements. |
| ***Depth*** | **Relatively deep:** Supports firms commercialising their R&D results. |

| Policy Instrument / Intervention | The Korea-Israel Industrial R&D Foundation (KORIL-RDF) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** The joint project must be undertaken in Korea and Israel. At least 30% of the actual R&D work must be done in Korea as well as in Israel. |
| ***Level of Support*** | **High:** Firms can receive **up to NIS 3.4 million (circa €834,000)** for a joint project. |
| ***Predictability*** | **Relatively predictable:** Available since 2001. Exact amount available may vary year-by-year. |
| ***Flexibility*** | **Less flexible:** The joint project must be carried out in both Israel and Korea. **At least 30%** of the work must be carried out in each country. |
| ***Differentiation*** | **Differentiated:** Firms can receive funding on a **wide range** of different scales. |
| ***Depth*** | **Deep:** Supports firms in their innovation process. |

| Policy Instrument / Intervention | Israel-US Binational Industrial Research and Development (BIRD) Foundation (BIRD Foundation) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Each firm directly receives the portion of the total grant that is relative to its share in the budget. Payments are made after receipt and approval of a joint technical report and a separate fiscal report submitted by each firm at the end of each segment (generally every 6 months). These reports cover the development progress and the actual expenses incurred during the segment. |
| ***Level of Support*** | **High:** Offers support worth **up to NIS 3.4 million (circa €834,000)**. |
| ***Predictability*** | **Predictable:** Available since 1977. Structure has been consistent. |
| ***Flexibility*** | **Less flexible:** Agreed budget is expected to cover the duration of the project. |
| ***Differentiation*** | **Differentiated:** There are **two types of projects** that are supported, Full-Scale Projects, and Mini-Projects. |
| ***Depth*** | **Relatively deep:** Supports firms' in Israel and the US conducting R&D together to produce products or services. |

| Policy Instrument / Intervention | Canada-Israel Industrial R&D Foundation (CIIRDF) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Firms agreed to have milestones throughout the project. At each milestone (typically 3 – 4 milestones during the entire period), a team from the firm must report on the progress made and expenses incurred toward the completion of eligible activities. CIIRDF will reimburse 50% of the expenses incurred. |
| ***Level of Support*** | **Medium:** CIIRDF support **up to 50%** of the joint study costs up. Feasibility studies receive a maximum of approximately **NIS 51,522 (circa €12,897)**. Collaborative R&D receives a maximum of approximately **NIS 2 million (circa €515,800)**. |
| ***Predictability*** | **Predictable:** Available since 1994. Structure has remained consistent. |
| ***Flexibility*** | **Less flexible:** Funding is tied to delivering agreed upon deliverables at each milestone. |
| ***Differentiation*** | **Relatively differentiated:** The foundation invests in two types of bilateral R&D initiatives undertaken by Canadian and Israeli partners. Feasibility studies and collaborative R&D projects. Different levels of funding are available depending on which initiative firms avail of. |
| ***Depth*** | **Relatively deep:** Supports firms engaging in R&D and commercialisation of the new technology. |

**Sources of information used in compiling Table 15: Canada-Israel Industrial Research and Development Foundation (2020a; 2020b), Department of Science and Technology (2020), Israel Innovation Authority (2020a; 2020b; 2020c; 2020d; 2020e; 2020f; 2020g; 2020h; 2020i; 2020j; 2020k; 2020l; 2020m; 2020n; 2020o; 2020p; 2020q; 2020r), Israel-U.S. Binational Industrial Research and Development Foundation (2020a; 2020b; 2020c), Korea-Israel Industrial R&D Foundation (2020), OECD STIP Compass (2020g), Singapore-Israel Industrial R&D Foundation (2020a; 2020b), Slideshare (2012).**

## Section 3.8 Singapore

There are many funding agencies/government bodies responsible for innovation and science policy instruments at the firm level in Singapore. These include:

1. Enterprise Singapore (ESG)

*Enterprise Singapore* (ESG) is a statutory board under the Ministry of Trade and Industry (MTI) in Singapore. ESG was formed from a merger between the Standards, Productivity and Innovation Board Singapore (SPRING) and International Enterprise Singapore (IE) (ESG, 2020a). ESG supports Small and Medium-sized Enterprises (SMEs) to develop, upgrade capabilities, innovate, and internationalise (ESG, 2020a). ESG supports the growth of Singapore as a trading and start-up hub, and serves as the national standards and accreditation body (ESG, 2020b). ESG offers a series of supports for firms carrying out innovation and R&D, many of which are hybrid versions of previous SPRING Singapore and IE Singapore policy instruments, while others are newly introduced policy instruments from ESG (ESG, 2020a).

2. Monetary Authority of Singapore (MAS)

The *Monetary Authority of Singapore* (MAS) is Singapore's central bank and integrated financial regulator (MAS, 2020a). MAS works with the financial industry to develop Singapore as a dynamic international financial centre (MAS, 2020b). MAS's mission is to promote sustained non-inflationary economic growth, and a sound and progressive financial centre (MAS, 2020a). As part of this, MAS supports firm-level innovation in the financial technology sector through a series of grant programmes (MAS, 2020c).

3. Economic Development Board (EDB)

The *Singapore Economic Development Board* (EDB), a government agency under the Ministry of Trade and Industry, is responsible for strategies that enhance Singapore's position as a global centre for business, innovation, and talent (Singapore Government, 2020). It is responsible for designing and delivering solutions that create value for investors and firms in Singapore (EDB, 2020a). In this way, EDB seeks to create economic opportunities and jobs for the people of Singapore and helps shape Singapore's economic future (EDB, 2020a). EDB implements a series of tax deductions and schemes designed to support firm-level R&D (EDB, 2020b).

4. Inland Revenue Authority of Singapore (IRAS)

The *Inland Revenue Authority of Singapore* (IRAS) is the main body responsible for tax administration in Singapore (IRAS, 2020a). IRAS collects taxes that account for circa 70% of the government's operating revenue that support economic and social programmes (IRAS, 2020a). IRAS also represents the Singapore government in tax treaty negotiations, drafts tax legislations and provides advice on property valuation to the Government (IRAS, 2020a). With regard to firm-level innovation, when firms meet strict requirements, IRAS offers a possible tax deduction for eligible R&D expenses (IRAS, 2020b). These deductions can be taken to reduce firms' contributions towards their corporation tax.

5. The Singapore-Israel Industrial R&D Foundation (SIIRD)

The *Singapore-Israel Industrial R&D Foundation* (SIIRD) is a co-operation between the Enterprise Singapore (ESG) and the Israel Innovation Authority to promote, facilitate and support joint industrial R&D collaboration between Singapore-based firms and Israel-based firms across different industries (SIIRD, 2020a). SIIRD provides R&D partnership search assistance to Singapore-based and Israel-based firms across different industries who seek to engage in R&D collaborations. SIIRD seeks to promote R&D in Singapore and Israel by helping Singapore-based and Israel-based firms with R&D Partner Search, and providing up to S$1.3 million (circa €846,000) in funding for joint R&D projects between both firms (SIIRD, 2020a).

6. National Research Foundation (NRF)

Singapore's *National Research Foundation* (NRF) is a department within the Singapore Prime Minister's Office (NRF, 2020a). The NRF sets the national direction for R&D by developing policies, plans and strategies for research, innovation, and enterprise (NRF, 2020a). It also funds strategic initiatives and builds up R&D capabilities by nurturing research talent. The NRF aims to transform Singapore into an R&D hub that contributes towards a knowledge-intensive, innovative, and entrepreneurial economy (NRF, 2020a). The NRF helps support research institutions collaborating with firms (NRF, 2020b). Through the collaboration, NRF aims to ensure that research carried out has an impact outside of the academic domain (NRF, 2020a). The aim of these initiatives is to commercialise research findings and bring innovative products to the market[7].

7. The Building and Construction Authority (BCA)

The *Building and Construction Authority* (BCA) is an agency under the Ministry of National Development, whose mission is to shape a safe, high quality, sustainable and friendly built environment (BCA, 2020a). As the lead public agency, BCA aims to transform Singapore into a future-ready built environment (BCA, 2020b). To achieve this, BCA supports firms conducting R&D and innovation in construction (BCA, 2020c).

[7] For more information at Singapore's National Research Foundation, see https://www.nrf.gov.sg/about-nrf/national-research-foundation-singapore

**Table 16: Innovation and science policy instruments available to firms in Singapore (2007-2020)**

| **Policy Instrument / Intervention** | **Enterprise Development Grant (EDG; First introduced in 2018; Merged the former *Capability Development Grant* and *Global Company Partnership*)** |
|---|---|
| ***Agency responsible*** | Enterprise Singapore |
| ***Criteria / Eligibility Requirements*** | Available to Small and Medium-sized Enterprises (SMEs) in Singapore with a minimum of 30% local shareholding, who are in a financially viable position to complete the project. Although the support is available for non-R&D projects, firms that apply under the *Innovation and Productivity pillar* carry out R&D projects to develop innovative products that can be sold to the market. Topics covered can include product development, product redesign and automation. The maximum support for qualifying projects is **up to 70%** of eligible costs. However, Due to the Covid-19 pandemic, from March 2020 until December 2020 this was increased to enable eligible firms and projects to claim **up to 80% of the qualifying costs**. In addition, SMEs adversely affected by the Covid-19 pandemic may get up to **90% grant support on a case-by-case basis**. |
| ***What is the support for?*** | Helps SMEs in Singapore build internal capabilities in three business areas, one of which is **innovation and productivity** (the other two areas being non-R&D). |
| ***Funding and Scale*** | Exact funding and scale unavailable. Typically support up to 70% of eligible costs. |

| **Policy Instrument / Intervention** | **Capability Development Grant (CDG; First introduced in 2015)** |
|---|---|
| ***Agency responsible*** | Enterprise Singapore |
| ***Criteria / Eligibility Requirements*** | Available to SMEs in Singapore. Helps build capabilities across 10 key business areas, such as financial management, human capital development and business model transformation. In 2017, CDG was enhanced to support product development. This includes **up to 70% of qualified costs** for product design, development, and manufacturing processes when manufacturing products in small volumes, prior to mass production. |
| ***What is the support for?*** | Helps SMEs **build capabilities** across key business areas. |
| ***Funding and Scale*** | Exact funding details are unavailable. |

| **Policy Instrument / Intervention** | **Singapore – Israel Industrial R&D Foundation (SIIRD; First introduced in 1997)** |
|---|---|
| ***Agency responsible*** | Enterprise Singapore (ESG) and Israel Innovation Authority (IIA) |
| ***Criteria / Eligibility Requirements*** | Available to any registered firms in Singapore and Israel including start-ups, SMEs and Multinational Corporations (MNCs), subject to eligibility criteria. The application must be jointly submitted by a Singapore-registered firm and an Israel-registered firm. Either firm must not have more than 20% shareholding in the partnering firm. The joint project must be undertaken in Singapore and Israel, with at least 30% of the actual R&D work located in Singapore and Israel respectively. Technology and product developed must have potential for commercialisation. SIIRD provides R&D funding **up to S$1.3 million (circa €846,000)** for joint R&D projects between firms based in Israel and Singapore. |
| ***What is the support for?*** | Promotes, facilitates, and supports **joint industrial R&D collaboration** between Singapore-based firms and Israel-based firms across different industries. |
| ***Funding and Scale*** | S$167 million (circa €94.7 million), 114 projects (1997 – 2012) |

| **Policy Instrument / Intervention** | **Singapore-France Joint Innovation Call (First introduced in 2018)** |
|---|---|
| ***Agency responsible*** | Enterprise Singapore (ESG) and Bpifrance (a French investment bank) |
| ***Criteria / Eligibility Requirements*** | Available to SMEs in Singapore with a minimum of 30% local shareholding and in a financially viable position to complete the project. The joint R&D project should **aim to develop a product**. Subject to same regulations as ESG's *Enterprise Development Grant* (EDG). Offers support worth up to **70% of qualifying project costs** for firms in Singapore. The French partner firm is funded through a reimbursable advance of up to €3 million or a grant of up to 45% of the project cost for *Deep Tech* projects. *Deep Tech* refers to start-ups that offer products or services based on breakthrough innovations. If the project is found to be eligible, each project partner is required to submit a related funding application form to their respective country funding bodies. Firms in Singapore must submit an EDG grant application. |
| ***What is the support for?*** | Encourages the **development of ready-to-market solutions** for products, technology-based services or methods that have strong potential for the French, Singapore, or international market. |
| ***Funding and Scale*** | Exacting funding and scale unavailable. Singaporean firms can receive support up to 70% of qualifying project costs. French firms can receive between €50,000 up to €3 Million |

**Table 16: Innovation and science policy instruments available to firms in Singapore (2007-2020) (continued [1])**

| Policy Instrument / Intervention | Innovation and Capability Voucher (ICV; First introduced in 2012; Replaced the Innovation Voucher Scheme [IVS]) |
|---|---|
| ***Agency responsible*** | Standards, Productivity and Innovation Board Singapore (SPRING-since 2018, merged into Enterprise Singapore [ESG]) |
| ***Criteria / Eligibility Requirements*** | Available to local firms that meet three requirements: 1) Firms must be locally registered residents of Singapore; 2) Firms must hold at least 30% of local shares; 3) firms must be of a size that fits the characteristics of an SME. Specifically, annual sales must not amount to more than S$100 million (circa €61.7 million), or the enterprise must not have employed more than 200 employees. ICV is worth **up to S$5,000 (circa €3,088)**. The innovation segment under the ICV covers technological development and technological assistance, including assistance in business design. This segment that the ICV covers upgrading of the firm's products, goods, and operations. Firms can exchange ICVs with service providers, including the public knowledge institutes. |
| ***What is the support for?*** | Encourages SMEs to **develop their business capabilities** through consultancy in human resources, innovation, productivity, and financial management. |
| ***Funding and Scale*** | Exact funding and scale unavailable. Supports firms up to S$5,000 (circa €3,088) per voucher. |

| Policy Instrument / Intervention | R&D Tax Credit |
|---|---|
| ***Agency responsible*** | Inland Revenue Authority of Singapore (IRAS) |
| ***Criteria / Eligibility Requirements*** | Available to all firms in Singapore. Must meet three requirements to be eligible: 1) The objective of the project is to acquire new knowledge, create new products or processes or improve existing products or processes; 2) It involves novelty or technical risk; 3) It involves a systematic, investigative and experimental (SIE) study in a field of science or technology. For in-house R&D, IRAS offers 100% tax deduction; and an additional 150% deduction on staff costs (excluding directors' fees) and consumables. For outsourced R&D, IRAS offers a **100% tax deduction on eligible costs**; and **an additional 150% deduction** on: 60% of the fee paid, or actual staff costs (excluding directors' fees) and consumables incurred if the amount is more than 60% of fee paid. If the R&D is conducted wholly overseas, firms can receive a 100% deduction for R&D that is related to the firm's trade. No deduction is given if R&D conducted is not related to the firm's trade. |
| ***What is the support for?*** | Encourage **firm-level R&D** in Singapore, and **build innovative capabilities** in firms and firms' employees. |
| ***Funding and Scale*** | Exact funding and scale unavailable. Supported approximately 520 firms in 2018. |

| Policy Instrument / Intervention | Monetary Authority of Singapore (MAS) Financial Sector Technology and Innovation (FSTI) Proof-of-Concept Grant (First introduced in 2016) |
|---|---|
| ***Agency responsible*** | Monetary Authority of Singapore (MAS) |
| ***Criteria / Eligibility Requirements*** | Available to MAS-regulated financial institutions or technology/solution providers working with MAS-regulated financial institutions for the early stage development of novel solutions to problems in the financial industry. The funding rate and funding cap is tiered. It depends on the outcome of a merit-based **Panel Evaluation**. For applicants that received three favourable evaluation recommendations: The funding rate will be **50%**, and the funding cap will be **S$200,000 (circa €123,000)**. For applicants that received four favourable recommendations: The funding rate will be **60%**, and the funding cap will be **S$300,000 (circa €185,000)**. For applicants that received five favourable recommendations: The funding rate will be **70%**, and the funding cap will be **S$400,000 (€247,000)**. |
| ***What is the support for?*** | Provides funding support for experimentation, development, and dissemination of **nascent innovative technologies** in the financial services sector. |
| ***Funding and Scale*** | Exact funding scale unavailable. In 2016, MAS committed to a five-year investment of S$225 million (approximately €138.9 million) through the FSTI scheme. In 2020, MAS committed S$250 million (approximately €154.3 million) into an enhanced FSTI 2.0 over the following three years. |

**Table 16: Innovation and science policy instruments available to firms in Singapore (2007-2020) (continued [2])**

| Policy Instrument / Intervention | Monetary Authority of Singapore (MAS) Financial Sector Technology and Innovation Scheme (FTSI) – Innovation Centre (First introduced in 2016) |
|---|---|
| ***Agency responsible*** | Monetary Authority of Singapore (MAS) |
| ***Criteria / Eligibility Requirements*** | Available to a financial institution (FI) or a corporate entity involved in either establishing, expanding, or relocating an identified innovation function to Singapore. For new *Innovation Centres*: **50% co-funding on qualifying roles** for a **period of 24 months** for each qualifying professional headcount's basic monthly salary. For existing *Innovation Centres*: **50% co-funding on new Singaporean hires** for qualifying roles for a period of 24 months for each qualifying professional headcount's basic monthly salary. Existing *Innovation Centres* include entities which either 1) have not been funded by FSTI, or 2) have been funded by FSTI but funding support has expired. Applications are considered under three main criteria: Team composition; Innovation focus; Active engagement with local stakeholders. |
| ***What is the support for?*** | Seeks to attract financial institutions to **set up *Innovation Centres*** of excellence or labs in Singapore to test-bed innovative ideas and roll out market solutions. |
| ***Funding and scale*** | Exact funding scale unavailable. In 2016, MAS committed S$225 million (approximately €138.9 million) towards the FSTI scheme, to be spread out over five years. In 2020, MAS committed S$250 million (approximately €154.3 million) into the enhanced FSTI 2.0 over the following three years. |

| Policy Instrument / Intervention | Monetary Authority of Singapore (MAS) Financial Sector Technology and Innovation (FSTI) Scheme – Institution-level Projects (First introduced in 2016) |
|---|---|
| ***Agency responsible*** | Monetary Authority of Singapore (MAS) |
| ***Criteria / Eligibility Requirements*** | Available to Singapore-based financial institutions (FIs), market or professional organisations or associations. **Supports projects up to 50%** of eligible costs, capped at **S$1 million (circa €618,747)**. Assessment criteria includes: 1) Innovative technology ideas or offerings in Singapore that are aligned to MAS's areas of focus and/or MAS's financial sector strategy; 2) Competitive funding for first-mover(s) to encourage other industry players to level-up and develop/adopt similar cutting-edge technology **(e.g. first-of-its-kind)**; 3) Projects should demonstrate significant impact to business operations (e.g. revenue and or cost savings, productivity, improved customer experiences) and are deployed/implemented in regional/global operations. |
| ***What is the support for?*** | Encourages Singapore-based financial institutions to **catalyse innovative ideas** and market solutions to advance the competitiveness of the financial institution and the sector. |
| ***Funding and scale*** | Exact funding scale unavailable. In 2016, MAS committed S$225 million (approximately €138.9 million) over five years towards FSTI scheme. In 2020, MAS committed S$250 million (approximately €154.3 million) into the enhanced FSTI 2.0 over the following three years. |

| Policy Instrument / Intervention | A*ccelerate (First introduced in 1995) |
|---|---|
| ***Agency responsible*** | The Agency for Science, Technology and Research (A*STAR) |
| ***Criteria / Eligibility Requirements*** | Available to all researchers and research institutes in Singapore. Aims to help researchers commercialise their research findings. Through this support, *A*ccelerate* aids firms' growth in Singapore and beyond through accelerating the translation of inventions and intellectual capital into marketable products, processes, and services. Offers a range of specific supports to assist the **commercialisation of research,** including *A*STAR Patents*, *Tech Depot*, and *Ready-To-Sign Licenses and Diagnostics Development Hub* (DxD). |
| ***What is the support for?*** | *A*ccelerate* is the marketing and commercialisation arm of A*STAR. Manages the intellectual property portfolio of A*STAR's research institutes and centres. Promotes the institutes research capabilities and facilitates the **efficient transfer of A*STAR's technologies to industry**. |
| ***Funding and scale*** | Exact funding and scale unavailable. |

**Table 16: Innovation and science policy instruments available to firms in Singapore (2007-2020) (continued [3])**

| Policy Instrument / Intervention | Research Incentive Scheme for Companies (RISC) |
|---|---|
| ***Agency responsible*** | Singapore Economic Development Board (EDB) |
| ***Criteria / Eligibility Requirements*** | Available to all to firms incorporated in Singapore that are prepared to make significant investments in R&D activities in science and technology. The grant will only be awarded on a prospective basis, to projects that have not commenced. A firm awarded a RISC grant is eligible for co-funding support **up to 30% of qualifying R&D project costs**. Local manpower may be accorded support of up to 50%. Firms applying for the grant will be assessed on the quantitative and qualitative merits of the proposed project. These include the employment of research scientists and engineers, total business expenditure in R&D which generates spin-off to the economy, investments in fixed assets, and the firm's commitment to growing R&D capabilities in Singapore. |
| ***What is the support for?*** | Aimed at encouraging firms in Singapore to **conduct or expand their R&D activities in science and technology**. |
| ***Funding and scale*** | Exact funding and scale unavailable. |

| Policy Instrument / Intervention | Intellectual Property (IP) Development Incentive (IDI; First introduced in 2017) |
|---|---|
| ***Agency responsible*** | Singapore Economic Development Board (EDB) |
| ***Criteria / Eligibility Requirements*** | Available to all firms. Firms must be prepared to make significant investments in contribution to the Singapore economy or advancement of capabilities towards globally leading industries. An approved *Intellectual Property* (IP) *Development Incentive* (IDI) firm is eligible for a reduced corporate tax rate of 5% or 10% of qualifying IP income derived by it during the incentive period. There are different requirements for firms to receive a 5% or 10% reduction. For a 5-year award, applicants must meet the necessary economic commitments: **5% reduction** – have incremental fixed asset investment or total annual business expenditure of S$10.5 million (circa €6.5 million), incrementally create 20 skilled jobs; **10% reduction** – have incremental fixed asset investment or total annual business expenditure of S$6.5 million (circa €4 million), create 15 incremental skilled jobs. |
| ***What is the support for?*** | To encourage the use and **commercialisation of intellectual property (IP) rights** arising from R&D activities. |
| ***Funding and scale*** | Exact funding and scale unavailable. |

| Policy Instrument / Intervention | 100 Experiment |
|---|---|
| ***Agency responsible*** | Artificial Intelligence (AI) Singapore (part of National Research Foundation Singapore) |
| ***Criteria / Eligibility Requirements*** | Available to all firms in Singapore. A firm can propose '*100 Experiment'* (or *100E*) problem statements where no commercial off-the-shelf (COTS) AI solution exists, but it could potentially be solved by Singapore's ecosystem of researchers and AI Singapore's engineering team within 9 to 18 months. AI Singapore will provide matched funding of up to S$250,000 (circa €154,500) per *100E* project for the Principal Investigators (PI) from Singapore's autonomous universities and A*STAR research institutes to work on the firm's problem statement. The firm is required to match the funding amount through in-kind (AI/engineering/IT/domain manpower) and cash contributions. Usually contributions are split 70:30 between in-kind and cash. Under the specific initiatives relating to COVID-19, the cash contribution from firms is reduced to 10%. |
| ***What is the support for?*** | The support aims to **solve firms' AI problem** statements and help firms build their own AI teams. |
| ***Funding and Scale*** | Exact funding and scale unavailable. Funds firms up to S$250,000 (circa €154,000). |

| Policy Instrument / Intervention | Early Stage Venture Fund (ESVF; First introduced in 2008) |
|---|---|
| ***Agency responsible*** | National Research Foundation (NRF) |
| ***Criteria / Eligibility Requirements*** | Available to Singapore-based early-stage technology start-ups. Through the *Early Stage Venture Fund* (ESVF), NRF committed S$10 million (circa €6.1 million) per fund, on a matched funding basis, to invest in technology start-ups. A challenge for start-ups is limited early stage financing in Singapore. ESVF aims to overcome this issue. Helps firms develop business models and improve their innovation capacity. |
| ***What is the support for?*** | Seed funds with selected venture capital firms to invest in Singapore-based **early-stage technology start-ups**. |
| ***Funding and scale*** | Exact funding scale unavailable. NRF supplied S$50 million (circa €30.8 million) in 2008 to co-finance the establishment of five early stage venture funds in Singapore. Allocated an additional S$50 million (circa €30.8 million) in 2013. Additional S$40 million (circa €24.7 million) was allocated in 2016. |

**Table 16: Innovation and science policy instruments available to firms in Singapore (2007-2020) (continued [4])**

| Policy Instrument / Intervention | Corporate Laboratories in Universities (First introduced in 2013) |
|---|---|
| ***Agency responsible*** | National Research Foundation (NRF) |
| ***Criteria / Eligibility Requirements*** | Available to larger firms. Industry partners can engage with scientific and technological capabilities built up in universities to develop new products and services, while universities achieve impact by developing cutting edge solutions for problems faced by industry. Laboratories receive joint funding from the firm and NRF. For example, the *Rolls-Royce@NTU Corporate Laboratory* received an initial S$75 million (circa €43.6 million) over five years. The Laboratory managed 53 research projects in areas such as power electronics, data analytics, and repair and manufacturing technologies. From 2019 to 2024, the Laboratory has been allocated S$88 million (circa €54.3 million). Research areas are geared towards supporting business growth for firms, generating economic benefits for Singapore, and creating 'good' jobs for Singaporeans. Corporate laboratories enable faculty, researchers, PhD, and Masters' students to work alongside firms on research that has direct relevance for industry. Students gain industry experience, preparing them for employment in high value-add sectors. |
| ***What is the support for*** | Encourages public-private R&D **partnerships between universities and firms** through the establishment of corporate laboratories in universities. |
| ***Funding and scale*** | Exact funding scale unavailable. 14 laboratories have received between S$54 million (circa €33.4 million) and S$110 million (circa €67.9 million), each as an initial investment. |

| Policy Instrument / Intervention | National Cybersecurity R&D Programme (NCR; First introduced in 2013) |
|---|---|
| ***Agency responsible*** | National Research Foundation (NRF) |
| ***Criteria / Eligibility Requirements*** | Available to all firms in Singapore. Enables collaboration between firms, research institutes and government agencies. Offers different supports for R&D, including the *National Satellites of Excellence* (launched in 2019), the *National Cybersecurity Laboratories,* and a variety of research grants. Funding amounts may vary. *National Satellite of Excellence in Trustworthy Software Systems* is supported with S$12 million (circa €7.4 million) in funding over four years (2019 – 2023). *National Satellite of Excellence in Mobile Systems Security & Cloud Security* is supported with S$7.5 million (circa €4.6 million) in funding over five years (2019 – 2024). *National Satellite of Excellence in Design Science and Technology for Secure Critical Infrastructure* is supported with S$12 million (circa €7.4 million) in funding over three years (2019 – 2022). Nine research projects were awarded a total of S$15.6 million (circa €9.6 million) under the second research grant call in 2017. |
| ***What is the support for?*** | To **develop R&D expertise and capabilities** in cybersecurity for Singapore. It aims to improve the trustworthiness of cyber infrastructures with an emphasis on security, reliability, resiliency, and usability. |
| ***Funding and scale*** | Exact funding scale unavailable. Allocated S$190 million (circa €117 million) from 2013 – 2020. |

| Policy Instrument / Intervention | 2 Stage Innovation Grant (iGrant) |
|---|---|
| ***Agency responsible*** | The Building and Construction Authority (BCA) |
| ***Criteria / Eligibility Requirements*** | Available to all firms registered and based in Singapore. The applicants must provide evidence that they have the financial capacity to complete the project. The projects must fulfil the following criteria: must be carried out in Singapore; must not have obtained similar funding from BCA or other public agencies; must not have commenced at the time of application. Funding is split into two stages. **Stage 1** Proof-of-Concept study. Firms can receive up to **70% of project costs or S$20,000 (circa €12,300)**, whichever is lower. **Stage 2** Project Implementation. Firms can receive up to **70% of project costs or S$250,000 (circa €154,000)**, whichever is lower. |
| ***What is the support for?*** | **Encourages and supports** the building and construction industry to conduct fast track, Proof-of-Concept **R&D projects**. |
| ***Funding and scale*** | Exact funding scale unavailable. Ministry of National Development (MND) allocated S$5 million (circa €3 million) for project grants in 2020 through BCA. |

**Sources of information used in compiling Table 16: Agency for Science, Technology and Research (2020), AI Singapore (2020), Building and Construction Association (2020a; 2020b; 2020c), Economic Development Board (2020a; 2020b), Enterprise Development Grant (2020), Enterprise Singapore (2020a; 2020b), European Commission (2020k), Inland Revenue Association of Singapore (2020a; 2020b; 2020c), Monetary Authority of Singapore (2020a; 2020b; 2020c; 2020d; 2020e), National Research Foundation (2020b; 2020c; 2020d; 2020e) Singapore Business Association (2020), Singapore-Israel Industrial R&D Foundation (2020a; 2020b), Slideshare (2012), Startup SG (2020).**

**Table 17: Design features of innovation and science policy instruments in Singapore (2007-2020)**

| Policy Instrument / Intervention | Enterprise Development Grant (EDG; Enterprise Singapore) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Projects funded under the *Enterprise Development Grant* (EDG) are supported on a reimbursement basis. Claims can only be submitted when all project deliverables have been achieved. Claims must be made to Enterprise Singapore within six months of the project qualifying period ending. |
| ***Level of Support*** | **High:** Typically covers **up to 70% of eligible costs**. Raised to 80% until end of 2020. |
| ***Predictability*** | **Relatively predictable:** Available since 2018. Temporary changes have increased grant rates. |
| ***Flexibility*** | **Relatively flexible:** All projects must be completed within 18 months of commencing, to ensure findings remain relevant in fast-paced environments. |
| ***Differentiation*** | **Relatively differentiated: All SMEs in Singapore** can avail of grant. SMEs affected by Covid-19 can apply for an additional 10%. |
| ***Depth*** | **Less deep:** Supports firms in development activities, including bringing innovative products to market. |

| Policy Instrument / Intervention | Capability Development Grant (CDG; Enterprise Singapore) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Only covers costs incurred after the project commencement date in application. Costs incurred before that date are not eligible. |
| ***Level of Support*** | **High:** Offers support **up to 70% of qualified costs** for product design, development, and manufacturing processes. |
| ***Predictability*** | **Predictable:** Available since 2015. In 2017, CDG was enhanced to support product development. In 2018, CDG was merged with the *Global Company Partnership* (GCP) grant to form the *Enterprise Development Grant*. |
| ***Flexibility*** | **Relatively flexible:** Some changes are allowed during the project. Supports firms across ten possible areas. |
| ***Differentiation*** | **Less differentiated:** Available to **all firms** who meet eligibility requirements. |
| ***Depth*** | **Less deep:** Supports firms in developing their capabilities. |

| Policy Instrument / Intervention | Singapore – Israel Industrial R&D Foundation (SIIRD) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** To receive funding, firms must make reports throughout the duration of the project. |
| ***Level of Support*** | **High:** Firms receive support of **up to 50% of eligible costs**. Depending on the grant firms avail of they can receive funding worth up to S$41,000 (circa €25,300), up to S$273,000 (circa €169,000), or between S$273,000 and S$1.36 million (circa €169,000 and €834,000). |
| ***Predictability*** | **Predictable:** Available since 1997. |
| ***Flexibility*** | **Relatively flexible:** Firms can make some changes. Must be justified in progress reports. |
| ***Differentiation*** | **Differentiated:** There are **different types of project grant** available under the overall SIIRD scheme. |
| ***Depth*** | **Relatively deep:** Supports is concerned with introducing new products and technology to the market. |

| Policy Instrument / Intervention | Innovation and Capability Voucher (ICV; SPRING Singapore; now Enterprise Singapore) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Both the SME and service provider submit an official project report showing how the voucher was used and how the service offered helped the firm grow. |
| ***Level of Support*** | **Low:** Vouchers are worth **up to S$5,000 (circa €3,088)**. |
| ***Predictability*** | **Predictable:** Available since 2012. |
| ***Flexibility*** | **Flexible:** Firms can use the voucher with any approved service provider. |
| ***Differentiation*** | **Less differentiated:** SMEs who met the eligibility requirements can avail of the voucher. |
| ***Depth*** | **Relatively deep:** Supports firms' expansion and growth. Allow firms to work with service providers, including public knowledge institutes, on topics including innovation. |

**Table 17: Design features of innovation and science policy instruments in Singapore (2007-2020) (continued [1])**

| Policy Instrument / Intervention | Singapore-France Joint Innovation Call (Enterprise Singapore and Bpifrance) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Projects are supported on a reimbursement basis. Claims are submitted when all project deliverables have been achieved. Firms must make claim to Enterprise Singapore within six months of the project qualifying period ending. |
| ***Level of Support*** | **High:** Covers **up to 70%** of eligible costs. |
| ***Predictability*** | **Relatively predictable:** Available since 2018. |
| ***Flexibility*** | **Relatively flexible:** Singapore firms are funded for up to two years. Must complete project in this timeframe. |
| ***Differentiation*** | **Less differentiated:** All **SMEs** in Singapore can avail of grant. Must enter a **consortium with a French firm** for the purpose of the project. |
| ***Depth*** | **Relatively deep:** Supports firms conducting R&D to bring an innovation to the market. |

| Policy Instrument / Intervention | R&D Tax Credit (Inland Revenue of Singapore [IRAS]) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Relatively stringent:** There is a strict definition of R&D that must be met before the firm can claim a deduction. Once firms meet the definition, they can claim a reduction on eligible expenses. |
| ***Level of Support*** | **High:** Offers tax deductions worth **up to 100% of eligible costs**, with an additional 150% eligible costs. |
| ***Predictability*** | **Relatively predictable:** Structure has changed. Since 2018, the tax treatment for R&D cost-sharing agreement (CSA) payment has been enhanced. As of 2020, provides 100% deduction on CSA payment, specific restriction rules under standard tax rules will not apply to CSA payment, and other terms and conditions have been removed from the CSA payment. |
| ***Flexibility*** | **Relatively flexible:** Firms must meet strict definition of R&D. However, once this is met, they can claim for an R&D tax deduction. |
| ***Differentiation*** | **Differentiated:** Available to firms who carry out eligible R&D. Support is split into two deductions. |
| ***Depth*** | **Deep:** One of the requirements is that R&D supports firms acquiring new knowledge. |

| Policy Instrument / Intervention | MAS Financial Sector Technology and Innovation (FSTI) Proof-of-Concept Grant (Monetary Authority of Singapore) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** A Financial Institution (FI) must serve as a 'Project sponsor' throughout. Project sponsors do not need to have a direct financial stake in the project, but must exhibit active engagement and commitment to see the project to completion. |
| ***Level of Support*** | **High:** Firms can receive **up to 70% of eligible costs**, up to S$400,000 (circa €247,000). |
| ***Predictability*** | **Relatively predictable:** Available since 2016. In 2020, MAS doubled the maximum funding amount, from S$200,000 to S$400,000 (circa €123,500 to €247,000) and increased the maximum funding support from 50% to 70% of qualifying project cost. Introduced a merit-based tiered funding mechanism to replace the existing flat 50% funding support of qualifying project cost. |
| ***Flexibility*** | **Relatively flexible:** Applicants may submit multiple proposals if there are multiple distinct components within a project that fit the qualifying criteria. Each proposal will be treated as a separate project and will be evaluated and funded separately. |
| ***Differentiation*** | **Differentiated:** The funding rate and funding cap will be **tiered** according to the outcome of a **merit-based Panel Evaluation**. |
| ***Depth*** | **Relatively deep:** Focused on the introduction of innovative technology to the market. |

**Table 17: Design features of innovation and science policy instruments in Singapore (2007-2020) (continued [2])**

| Policy Instrument / Intervention | MAS Financial Sector Technology and Innovation Scheme – Innovation Centre (Monetary Authority of Singapore [MAS]) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** *Innovation Centres* are expected to actively engage local stakeholders within the Financial Technology ecosystem. This can be through collaborations with Singapore-based research institutions, government entities or partnerships with Singapore-based Financial Technology firms. |
| ***Level of Support*** | **High:** 50% co-funding on qualifying roles for a period of 24 months for each qualifying professional headcount's basic monthly salary. |
| ***Predictability*** | **Predictable:** Available since 2016. |
| ***Flexibility*** | **Relatively flexible:** Funding is for a specific purpose. However, provided professionals qualify for support, they can be funded up to 50% of the basic monthly salary. Existing *Centres* receive support for new Singaporean hires for qualifying roles. |
| ***Differentiation*** | **Differentiated:** New *Centres* receive support for 50% of basic monthly salaries for qualifying professionals' salaries. Supports for existing *Centres* focuses on sponsoring 50% of new Singaporean hires. |
| ***Depth*** | **Deep:** Knowledge transfer is intended to foster local talent such as Singaporean graduates and Singaporean professionals. |

| Policy Instrument / Intervention | MAS Financial Sector Technology and Innovation Scheme – Institution-level Projects (Monetary Authority of Singapore [MAS]) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Unavailable:** No specific regulations stated for firms in available sources. |
| ***Level of Support*** | **High:** Up to 50% of level of funding support, capped at S$1 million (circa €618,747). |
| ***Predictability*** | **Predictable:** Available since 2016. |
| ***Flexibility*** | **Less flexible:** Applicants are expected to produce agreed deliverables. |
| ***Differentiation*** | **Relatively differentiated:** Supports all projects that meet eligibility requirements. Specific incentives for first mover(s), to encourage widespread adoption of cutting-edge technology (first-of-its-kind). |
| ***Depth*** | **Relatively deep:** Supports the commercialisation and market implementation of financial technology. |

| Policy Instrument / Intervention | A*ccelerate (Agency For Science, Technology and Research) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Relatively stringent:** Exact regulations varies depending on the project and which firms are involved. |
| ***Level of Support*** | **Exact level of support unavailable:** Offers a series of different supports for researchers and institutions. |
| ***Predictability*** | **Predictable:** Available since 1995. Support may vary depending on funding from industry partners. |
| ***Flexibility*** | **Relatively flexible:** Some changes are allowed within programme, as research findings are commercialised. |
| ***Differentiation*** | **Differentiated:** Offers a series of different supports for commercialising research. This includes: A*STAR Patents, Tech Depot, Ready-To-Sign Licenses and Diagnostics Development Hub (DxD). |
| ***Depth*** | **Deep:** Aims to commercialise the research findings of research institutes and centres. |

| Policy Instrument / Intervention | Research Incentive Scheme for Companies (RISC; Singapore Enterprise Development Board [EDB]) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Reports outlining the progress of the project, R&D capabilities and technologies developed, and the project plans for remaining incentive period must be submitted annually. Disbursement of grants will be made on a reimbursement basis, subject to satisfactory project implementation. |
| ***Level of Support*** | **Medium:** Firms can receive co-funding support of up to 30% of qualifying R&D project costs such as manpower, training, consultancy, equipment, software, intellectual property and materials costs. Local manpower may be accorded support of up to 50%. |
| ***Predictability*** | **Relatively predictable:** Structure has remained consistent. |
| ***Flexibility*** | **Less flexible:** In the event of any breach of term or condition of the agreed terms, the firm is subject to the potential revocation of the incentive and recovery of any associated benefits. |
| ***Differentiation*** | **Relatively differentiated:** Available to all firms who meet eligibility requirements. Support can be increased up to 50% if manpower is local. |
| ***Depth*** | **Relatively deep:** Supports firms engaging in R&D. |

**Table 17: Design features of innovation and science policy instruments in Singapore (2007-2020) (continued [3])**

| Policy Instrument / Intervention | Intellectual Property Development Incentive (IDI; Singapore Economic Development Board [EDB]) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** An approved *Intellectual Property Development Incentive* (IDI) firm must submit regular progress reports to the *Economic Development Board* (EDB) for the evaluation of performance. |
| ***Level of Support*** | **Medium:** Firms can receive a reduced corporate tax rate of either 5% or 10% on a percentage of qualifying IP income derived by it during the incentive period |
| ***Predictability*** | **Predictable:** Introduced in the Singapore Government's *Budget 2017*. |
| ***Flexibility*** | **Less flexible:** In the event of any breach of term or condition of the IDI, the firm is subject to the potential revocation of the incentive and recovery of any associated benefits. |
| ***Differentiation*** | **Differentiated:** Firms can receive either a 5% or 10% reduction in corporate tax. Firms must meet different economic conditions depending on the rate of reduction they receive. |
| ***Depth*** | **Relatively deep:** Supports firms in using and commercialising their IP rights arising from R&D activities. |

| Policy Instrument / Intervention | 100 Experiment (National Research Foundation [NRF]) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Firms must match the funding from Artificial Intelligence (AI) Singapore with cash and in-kind contributions. |
| ***Level of Support*** | **High:** Offers up to S$250,000 (circa €154,000) in support per project. Funding is allocated to universities and research institutions, not the firm itself. |
| ***Predictability*** | **Relatively predictable:** Structure has remained consistent. |
| ***Flexibility*** | **Flexible:** Firms propose the problem statements. The research aims to solve the statement. Project must be completed within 9-18 months. |
| ***Differentiation*** | **Relatively differentiated:** Firms who have AI problems are able to apply. Project specifics may vary depending on the firm's problem statement. |
| ***Depth*** | **Deep:** Links firms and academia to find innovative solutions to AI problems. |

| Policy Instrument / Intervention | Early Stage Venture Fund (ESVF; National Research Foundation [NRF]) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Relatively stringent:** The obligations can vary depending on the Venture Capital (VC) funds |
| ***Level of Support*** | **Medium:** Offers S$10 million (circa €6.2 million) to venture capital (VC) funds to then invest in eligible firms. |
| ***Predictability*** | **Predictable:** Available since 2008. Has received additional support in 2013 and 2016. |
| ***Flexibility*** | **Relatively flexible:** Exact restrictions and regulations may vary depending on the VC fund. |
| ***Differentiation*** | **Less differentiated:** Available to early stage technology firms in Singapore. |
| ***Depth*** | **Less deep:** Aims to help early stage start-ups overcome lack of funding and boost innovation capacity. |

| Policy Instrument / Intervention | Corporate Laboratories in Universities (National Research Foundation [NRF]) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Relatively stringent:** Stringency and regulations varies depending on the *Corporate Laboratory*. Different firms are involved in each Laboratory, with different research aims. |
| ***Level of Support*** | **High:** Offers joint funding of *Corporate Laboratories*. Funding between NRF and firms can between S$54 million and S$110 million (circa €33.4 million and €67.9 million). |
| ***Predictability*** | **Relatively predictable:** *Corporate Laboratories* have been established since 2013. Funding and availability can vary between *Laboratories*. |
| ***Flexibility*** | **Relatively flexible:** Varies depending on the Laboratory. There are different firms involved with different demands and regulations. |
| ***Differentiation*** | **Differentiated:** Different *Corporate Laboratories* focus on different research topics, have different amounts of investment, and have different firms involved. |
| ***Depth*** | **Deep:** Supports industry-academia relationships. |

**Table 17: Design features of innovation and science policy instruments in Singapore (2007-2020) (continued [4])**

| Policy Instrument / Intervention | National Cybersecurity R&D Programme (NCR; National Research Foundation [NRF]) |
|---|---|
| ***Design Feature*** | Description of Design Feature |
| ***Stringency*** | **Relatively stringent:** Regularly scheduled reports are submitted as part of programme. |
| ***Level of Support*** | **High:** The amount varies depending on the support availed of. For example, the average research grant available in 2017 was worth S$1.73 million (circa €1 million). |
| ***Predictability*** | **Predictable:** Available since 2013. Inaugural research grant was launched in 2014. Singapore Cybersecurity Consortium was established in 2016. The *National Cybersecurity R&D Laboratory* was set up in 2017. National Satellites of Excellence commenced operations in 2019. |
| ***Flexibility*** | **Less flexible:** Has very specific research themes. Research must fit in within these themes. |
| ***Differentiation*** | **Differentiated:** Offers different supports through the NCR programme. Firms can receive different amounts. |
| ***Depth*** | **Deep:** Support allows firms to collaborate on research projects and share data, resources and knowledge with research institutes and government agencies. |

| Policy Instrument / Intervention | 2 Stage Innovation Grant (iGrant; The Building and Construction Authority [BCA]) |
|---|---|
| **Design Feature** | Description of Design Feature |
| ***Stringency*** | **Stringent:** Firms receive support as a reimbursement upon submitting reports. **Stage 1** funding is given to firms once they submit a Proof-of-Concept (POC) study report and an application form for Stage 2. For **Stage 2** funding, 70% of funding is given upon submission of the Stage 2 progress report. The remaining 30% is reimbursed upon the approval of the final report. |
| ***Level of Support*** | **Medium:** Stage 1 recipients can receive up to 70% of eligible costs or S$20,000 (circa €12,300). Stage 2 recipients can receive up to 70% of eligible costs or S$250,000 (circa €154,000). |
| ***Predictability*** | **Relatively predictable:** Structure has remained consistent. Firms must pass through Stage 1 to receive Stage 2 funding. |
| ***Flexibility*** | **Less flexible:** Firms must submit reports at the end of Stage 1 and 2, as well as during Stage 2. Deliverables must be met for continued funding. |
| ***Differentiation*** | **Differentiated:** Support is split into two stages. Stage 1 is a Proof-of-Concept (POC) study worth up to 70% or S$20,000 (circa €12,300). Stage 2 is the Project Implementation phase worth up to 70% or S$250,000 (circa €154,000). |
| ***Depth*** | **Less deep:** Projects should be more downstream and nearer to market adoption. Aims to bring products to the market. |

**Sources of information used in compiling Table 17: Agency for Science, Technology and Research (2020), AI Singapore (2020), Building and Construction Association (2020a; 2020b; 2020c), Economic Development Board (2020a; 2020b), Enterprise Development Grant (2020), Enterprise Singapore (2020a; 2020b), European Commission (2020k), Inland Revenue Association of Singapore (2020a; 2020b; 2020c), Monetary Authority of Singapore (2020a; 2020b; 2020c; 2020d; 2020e), National Research Foundation (2020b; 2020c; 2020d; 2020e) Singapore Business Association (2020), Singapore-Israel Industrial R&D Foundation (2020a; 2020b), Slideshare (2012), Startup SG (2020).**

## Section 4. Conclusion

This report conducted a cross-country comparison of innovation and science policy instruments available to firms in Ireland, the UK, Germany, Belgium, Denmark, Norway, Israel, and Singapore, over the period 2007 to 2020. Each country's innovation and science policy instruments were analysed in extensive detail. Each country-level analysis was split into two sections. The first section examined the high-level details of each policy instrument. The details covered in the first section included the funding agency responsible for each policy instrument, the year the instrument was first implemented, key eligibility requirements, the intended purpose of the policy instrument, and the funding and scale of the instrument. Augmenting this important high-level administrative information, the second section of each country-level analysis provided a greater level of detail and nuance on each policy instrument. The details available in most publicly available, country-level repositories of information on innovation and science policy instruments (e.g. government reports and policy documents, the webpages of funding agencies or government departments) do not provide this depth of analysis. This level of detail is important when comparing nominally similar policy instruments across countries. The details covered in the second section of each country-level analysis were stringency, level of support, predictability, flexibility, and depth. Using this approach, a clearer understanding of the innovation and science policy instruments available in each country can be achieved. The report therefore provides an important resource for cross-country comparison.

In the period 2007-2020, each of the eight countries offered a unique mix of innovation and science policy instruments. The instruments included were designed to have an impact across both the economy and society. There was a wide focus across each country. Each country is characterised by several unique policy instruments, or places particular emphasis on certain policy instruments, which although common to many countries, hold a uniquely important role in in their country specific innovation system. For example, Ireland offered support for domestic firms (mostly SMEs) as well as the Multinationals Corporations (MNCs). Germany placed emphasis on the SMEs in the German Mittelstand. Belgium supported firm-level innovation and R&D through different tax credits and tax deductions. Denmark has aimed to increase the number of graduates who commercialise their ideas or start firms themselves. Norway placed significant emphasis on the environment and climate related innovation. Israel established many different international R&D partnerships with various countries. While Singapore emphasised support for innovation in financial technology. The country-level analyses in this report highlighted that these different emphases are operationalised by somewhat different policy instruments with design features intended to suit particular features of each national context.

Each country offered a range of innovation and science policy instruments at different depths, with depth referring to whether the instrument supports the creation of new knowledge, or focuses more on bringing an innovation to market. All countries included in this report deployed policy instruments designed to establish links between firms and academia. There has been great emphasis placed on the benefits of this type of approach across all countries included in this report. In some cases, the links were intended to transfer knowledge from academia to firms. In other cases, the intention was to commercialise the research results from academia.

The case of R&D tax credits offers a key example of how nominally similar policy instruments can differ significantly upon a more detailed inspection. While all countries included in this report offer some form of R&D tax credit scheme, the manner in which each country implements the credits can differ greatly. Ireland offers a 25 percent credit that can be deducted from the firm's corporation tax. The UK implements R&D tax credits through a two-tiered system that offers different rates based on whether the firm is an SME or a large firm. SMEs in this system can receive on average a 25 percent tax credit on qualifying R&D expenditure, while larger firms receive 13 percent. Having previously relied solely on direct measures of R&D support, in 2020 Germany introduced an R&D tax credit scheme for the first time. The German R&D tax credit is similar to that of Ireland, with a 25 percent credit worth up to €1 million. However, Belgium's R&D tax credit system is very different in how it is calculated. Firms in Belgium are eligible to deduct €3.38 from every €100 spent on R&D. This initially may seem significantly smaller than the other countries listed above. However, when examining Belgium's R&D tax credit in a more detailed manner, the analysis undertaken for the purpose of this report highlights that Belgium offers a series of tax deductions which augment this initial offering and allow firms to reduce their corporation tax further. Like Belgium, Denmark is somewhat different to the other countries considered in this report, as only loss-making firms are able to avail of the Danish R&D tax credit. Norway and Singapore share a key feature among their R&D tax credit schemes, in that they specify the need for knowledge creation as a crucial aspect of the R&D to qualify. Norway offers a 19 percent R&D tax credit across all qualifying firms, while Singapore implements a more complex scheme where firms can avail of differing tax deductions on certain qualifying costs.

In the academic world, there is great interest in identifying the *correct* policy mix with regard to innovation and science policy instruments available to firms (Kergroach 2019; Meissner & Kergroach 2019; Kergroach et al. 2018). However, a key finding emanating from this report is that countries are also trying to find the *correct* mix, as well as the *most effective* design for each individual policy instrument in the mix. Every country included in the cross-country comparison has made changes to the innovation and science policy instruments offered to firms over time. These changes involved amending existing instruments and introducing new ones, often in response to economic crises or changes in industrial/enterprise strategy. In addition, many of the funding agencies responsible for these instruments have merged, while new funding agencies have also been established. This degree of change shows that the desire to find the *correct* mix of policy instruments to support R&D and innovation at the firm level is not just a question for academic researchers. Rather, this is a crucial issue in the everyday worlds of government policymaking and business. The dynamics of these changes over time demonstrate that continued analysis of the innovation and science policy instruments available to firms is required. This form of temporal analysis enables a more complete understanding of the nature of R&D support at firm-level. In summary, this report finds that there can be a significant difference between innovation and science policy instruments that may initially appear nominally similar. Moreover, the repository of information provided here offers deep insight and analysis into each country's support for firm-level innovation and R&D.

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# Appendix

Table 1a: Data for Figure 1: Business Expenditure on R&D by source of funds and number of persons employed (Euros millions)

| Country | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Belgium** | 4420.386 | 4650.011 | 4574.8 | 5027.7 | 5613.4 | 6148.955 | 6356.837 | 6675.968 | 7076.364 | 7444.72 | 8333.61 |
| **Denmark** | 3972.99 | 4372.92 | 4772.85 | 4745.04 | 4717.23 | 4718.61 | 4720.00 | 4785.95 | 5133.31 | 5354.7 | 5576.09 |
| **Germany** | 43034 | 44154.5 | 45275 | 48176.1 | 51077.2 | 53790.1 | 53566.2 | 56996.5 | 60952 | 62826 | 68787.3 |
| **Ireland** | 1603.2 | 1686.7 | 1868.456 | 1833.6 | 1859.6 | 1961.692 | 2021.9 | 2106.8 | 2233 | 2501.607 | 2770.214 |
| **Norway** | 1796.704 | 2004.029 | 2008.958 | 2037.649 | 2204.984 | 2335.723 | 2477.092 | 2691.299 | 3017.404 | 3138.146 | 3384.503 |
| **UK** | 17506.38 | 17803.58 | 17498.88 | 17995.49 | 19497.18 | 19159.5 | 20661.54 | 22327.09 | 23391.42 | 24891.44 | 26526.98 |
| **Singapore** | 2702.18 | 3267.49 | 2364.55 | 2415.23 | 2852.11 | | | | | | |

*Source: Organisation for Economic Co-operation and Development (OECD), 2020c. Business enterprise R-D expenditure by size class and by source of funds. available at: https://stats.oecd.org/Index.aspx?DataSetCode=BERD_SIZE*

Table 1b: Data for Figure 1b: Business Expenditure on Research and Development

| Country | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Belgium** | 0.01068 | 0.01041 | 0.011191 | 0.012504 | 0.01291 | 0.015074 | 0.015116 | 0.015603 | 0.019145 | 0.020028 | 0.021403 |
| **Denmark** | 0.01627 | 0.01799 | 0.02065 | 0.020156 | 0.019773 | 0.019734 | 0.019558 | 0.019515 | 0.020452 | 0.020663 | 0.020927 |
| **Germany** | 0.01722 | 0.01734 | 0.018512 | 0.018786 | 0.018963 | 0.019593 | 0.019054 | 0.01947 | 0.020142 | 0.020042 | 0.021101 |
| **Ireland** | 0.02616 | 0.0289 | 0.03259 | 0.036114 | 0.040925 | 0.043997 | 0.042286 | 0.040772 | 0.035239 | 0.033882 | 0.034995 |
| **Norway** | 0.00822 | 0.00827 | 0.008895 | 0.008455 | 0.00849 | 0.008473 | 0.008673 | 0.009214 | 0.010429 | 0.010892 | 0.011043 |
| **UK** | 0.00825 | 0.00841 | 0.008624 | 0.008689 | 0.009295 | 0.009005 | 0.009504 | 0.009984 | 0.010218 | 0.010689 | 0.011197 |
| **Singapore** | 0.01548 | 0.01864 | 0.013083 | 0.011541 | 0.012683 | | | | | | |

*Source: (OECD, 2020c). Date Accessed: June 10th 2020. Calculated as a percentage of GDP (GNP for Ireland) by Author. Data Source: (Central Statistics Office, 2020a; Department of Statistics Singapore, 2020; Office of National Statistics, 2020; Statistics Denmark, 2020; Statistics Norway, 2020; The Federal Statistics Office, 2020; The World Bank, 2020). Israel data not available. Singapore data only available up until 2011.*

Table 2: Data for Figure 2: Government Support for BERD, 2006 and 2017

| Country | Direct Funding of BERD | Tax Support for BERD | Total 2006 (excluding subnational tax support) |
|---|---|---|---|
| **Belgium** | 0.063 | 0.2971 | 0.0966 |
| **UK** | 0.0868 | 0.209 | 0.1201 |
| **Norway** | 0.1038 | 0.1263 | 0.1141 |
| **Ireland** | 0.0536 | 0.1881 | 0.0907 |
| **OECD** | 0.0827 | 0.0993 | 0.1574 |
| **Israel*** | 0.1145 | N/A | 0.1674 |
| **Germany** | 0.0672 | 0 | 0.0777 |
| **Denmark** | 0.04 | 0.0206 | 0.0453 |

*Source: Organisation for Economic Co-operation and Development (OECD), 2020b. OECD R&D Tax Incentive Database. available at: http://oe.cd/rdtax, June 2020.*

Table 3a: Data for Figure 3a: Government Financed BERD, Euro Millions (2006 – 2017)

| Year | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Belgium** | 233.9 | 250 | 270.5 | 301.2 | 389.8 | 350.1 | 329 | 332.8 | 360.6 | 388.4 | 334.75 | 281.1 |
| **Denmark** | 96.785 | 96.785 | 110.59 | 123.21 | 130.676 | 130.182 | 132.89 | 83.772 | 112.08 | 140.4 | 126.75 | 113.1 |
| **Germany** | 1854 | 1936 | 2073 | 2021.7 | 2095.8 | 2221.4 | 2339.4 | 1799.9 | 1915.2 | 2037 | 2111 | 2181.4 |
| **Ireland** | 71 | 87.8 | 92.3 | 77.9 | 76.4 | 110 | 116 | 120.7 | 125.8 | 111 | 113.8 | 127.6 |
| **Israel** | 287.22 | 308.37 | 305.075 | 320.07 | 301.1 | 229.825 | 288.57 | 252.25 | 360.25 | 340.25 | 340.75 | 364 |
| **Norway** | 131.25 | 140.02 | 183.11 | 196.04 | 206.045 | 219.364 | 241.96 | 234.526 | 233.90 | 266.43 | 299.886 | 324.957 |
| **UK** | 1211.3 | 1191.3 | 1171.2 | 1380.9 | 1560.94 | 1806.11 | 1510.2 | 1846.65 | 2079.9 | 2036.0 | 1942.64 | 2013.53 |

*Source: Organisation for Economic Co-operation and Development (OECD), 2020e. OECD R&D Tax Incentive Database. available at: https://stats.oecd.org/Index.aspx?DataSetCode=RDTAX, June 2020.*

Table 3b: Data for Figure 3b: Government Financed BERD, percent of GDP (2006 – 2017)

| Year | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Belgium** | 0.071 | 0.0727 | 0.0769 | 0.0869 | 0.1073 | 0.0931 | 0.085 | 0.0847 | 0.08895 | 0.0932 | 0.0781 | 0.063 |
| **Denmark** | 0.042 | 0.0428 | 0.0472 | 0.055 | 0.0555 | 0.0542 | 0.053 | 0.0334 | 0.0432 | 0.053 | 0.0465 | 0.04 |
| **Germany** | 0.077 | 0.0775 | 0.0814 | 0.0827 | 0.0817 | 0.0825 | 0.085 | 0.064 | 0.0654 | 0.0672 | 0.0674 | 0.0672 |
| **Ireland GNP** | 0.044 | 0.05195 | 0.05736 | 0.05549 | 0.05487 | 0.08019 | 0.083 | 0.08028 | 0.07682 | 0.05527 | 0.05179 | 0.05358 |
| **Ireland GDP** | 0.038 | 0.0445 | 0.0492 | 0.0458 | 0.0456 | 0.0644 | 0.066 | 0.0672 | 0.0646 | 0.0422 | 0.0419 | 0.0429 |
| **Israel** | 0.167 | 0.1678 | 0.1574 | 0.1569 | 0.1377 | 0.0983 | 0.116 | 0.0955 | 0.1301 | 0.1168 | 0.1113 | 0.1145 |
| **Norway** | 0.062 | 0.0627 | 0.0739 | 0.085 | 0.0837 | 0.0827 | 0.085 | 0.0804 | 0.0784 | 0.0901 | 0.1019 | 0.1038 |
| **UK** | 0.073 | 0.0686 | 0.0658 | 0.0797 | 0.087 | 0.0972 | 0.078 | 0.0925 | 0.0997 | 0.0948 | 0.0869 | 0.0868 |

*Source: Organisation for Economic Co-operation and Development (OECD), 2020e. OECD R&D Tax Incentive Database. available at: https://stats.oecd.org/Index.aspx?DataSetCode=RDTAX, June 2020.*

Table 4a: Data for Figure 4a: Indirect government support through R&D tax incentives, Euros Millions

| Year | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Belgium** | 80.2 | 173.8 | 295.5 | 525.8 | 635.4 | 706.3 | 774.5 | 899.7 | 1105 | 1364.4 | 1289.2 | 1326 |
| **Denmark** | 5.72 | 5.72 | 6.11 | 7.67 | 6.11 | 6.5 | 25.35 | 28.457 | 42.289 | 52.689 | 52.195 | 58.24 |
| **Germany** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Ireland** | 74.7 | 165.6 | 145.7 | 216.1 | 224 | 261 | 282 | 421 | 553 | 708 | 670 | 448 |
| **Norway** | 108.965 | 94.43 | 98.705 | 112.575 | 116.85 | 124.735 | 134.805 | 151.525 | 203.49 | 282.245 | 354.35 | 395.295 |
| **UK** | 772.8 | 907.2 | 1120 | 1131.2 | 1243.2 | 1366.4 | 1534.4 | 1836.8 | 3343.2 | 4323.2 | 4916.8 | 4849.6 |

*Source: Organisation for Economic Co-operation and Development (OECD), 2020e. OECD R&D Tax Incentive Database. available at: https://stats.oecd.org/Index.aspx?DataSetCode=RDTAX, June 2020.*

Table 4b: Data for Figure 4b: Indirect government support through R&D tax incentives as a percent of GDP

| Year | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Belgium** | 0.0247 | 0.050 | 0.084 | 0.1518 | 0.175 | 0.1879 | 0.2006 | 0.229 | 0.2742 | 0.3274 | 0.2995 | 0.2971 |
| **Denmark** | 0.002 | 0.002 | 0.0026 | 0.0034 | 0.002 | 0.0027 | 0.0103 | 0.0113 | 0.0164 | 0.0199 | 0.019 | 0.0206 |
| **Germany** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Ireland (GNP)** | 0.046 | 0.098 | 0.09055 | 0.15394 | 0.160 | 0.19028 | 0.20177 | 0.28004 | 0.33772 | 0.35257 | 0.30492 | 0.18812 |
| **Norway** | 0.051 | 0.042 | 0.0399 | 0.0488 | 0.047 | 0.047 | 0.0479 | 0.0519 | 0.0682 | 0.0955 | 0.1204 | 0.1263 |
| **UK** | 0.046 | 0.052 | 0.0629 | 0.0653 | 0.069 | 0.0735 | 0.08 | 0.092 | 0.1603 | 0.2014 | 0.22 | 0.209 |

*Source: Organisation for Economic Co-operation and Development (OECD), 2020e. OECD R&D Tax Incentive Database. available at: https://stats.oecd.org/Index.aspx?DataSetCode=RDTAX, June 2020.*